FEBRUARY 9, 1935.

UNIVERSITY OF CONNECTICUT · FEB 26 1935 · PERIODICAL ROOM · LIBRARY

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.
Telegrams: LANCET, RAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229

No. VI. OF VOL. I., 1935. LONDON, SATURDAY, FEBRUARY 9, 1935. Pp. 120—Price 1s.
No. 5815. VOL. CCXXVIII. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £2 2s. Abroad £2 10s.

OXFORD MEDICAL PUBLICATIONS.

SEE PAGE 5

BY W. SAMPSON HANDLEY, M.S. LOND., F.R.C.S., Surgeon to the Middlesex Hospital.

CANCER OF THE BREAST AND ITS TREATMENT.
Second Revised Edition. With 82 Illustrations. 30s. net. (John Murray.)

THE GENESIS OF CANCER: A STUDY OF THE GENETIC RELATIONSHIP OF LYMPH-STASIS AND CANCER.
Just Published. 113 Illustrations. 21s. net.
(Kegan Paul, Anglo-French Library.)

NOW READY. SECOND EDITION.
DISEASES OF THE RECTUM AND COLON AND THEIR SURGICAL TREATMENT.
BY
J. P. LOCKHART-MUMMERY,
F.R.C.S. ENG., M.A., M.B., B.C. CANTAB.,
Senior Surgeon to St. Mark's Hospital.
Pp. viii + 616, with 247 Illustrations. Price 35s.

Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2

ALL FRENCH MEDICAL WORKS AND PERIODICALS.
Catalogues and full information direct from:
The United French Publishers,
120, Boulevard Saint-Germain, Paris VI.

A MANUAL OF MENTAL DISEASES.
A Text-book for Students and Practitioners in India.
By C. LODGE PATCH, M.C., M.R.C.S., L.R.C.P., Major I.M.S., Med. Supt., Punjab Mental Hospital.
Pp. viii + 326. Price 10s. 6d. Postage 6d., abroad 10d.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

FRACTURES.
By MEURICE SINCLAIR, C.M.G., M.B., CH.B. (EDIN.)
With an Introduction by Sir ROBERT JONES, Bt., F.R.C.S.
Pp. 550. 337 X ray photographs, photographs and diagrams. 24s. net.
Constable & Co., Ltd., London.

TRILOGY OF SEXOLOGY & VENEREOLOGY.
By ROBERT V. STORER, M.R.C.S., L.R.C.P.
ADOLESCENCE AND MARRIAGE: A Comprehensive Survey of the Ethics, Psychology, and Hygiene of Sexual Life. (London: John Lane, The Bodley Head. 8s. 6d.)
GONOCOCCAL INFECTION: Modern Methods of Diagnosis and Treatment. (London: Bale, Sons and Danielsson. 7s. 6d.)
SEX AND DISEASE: A Practical Handbook for Practitioners and Patients. (London: Bale, Sons and Danielsson. 4s. 6d.)

FIVE NEW BOOKS

TROPICAL MEDICINE
By Sir LEONARD ROGERS, *K.C.S.I.*, M.D., F.R.S. and Sir J. W. D. MEGAW, *K.C.I.E.*, M.B.
Second Edition. 2 Col. Plates and 82 Text-figures. 15s.

CHRONIC RHEUMATISM: Causation and Treatment
By R. FORTESCUE FOX, M.D. and J. VAN BREEMEN, M.D.
8 Plates and 36 Text-figures. 12s. 6d.

RADIOLOGICAL TERMINOLOGY
By C. E. GAITSKELL, M.R.C.S., L.R.C.P. 5s.

THE PHARMACOLOGICAL ACTION OF THE HARROGATE DRINKING WATERS
By W. BAIN, M.D., F.R.C.P. 26 Illustrations. 5s.

THE MEDICAL DIRECTORY 1935
Ninety-first Annual Issue. 2,407 Pages. 57,128 Names. 36s.
London: J. & A. Churchill Ltd., 40 Gloucester-place, W.1.

¶ "*This book should certainly make and keep for itself a place in urological literature.*"—LANCET.

UROLOGY IN WOMEN:
A HANDBOOK OF URINARY DISEASES IN THE FEMALE SEX.
By E. CATHERINE LEWIS, M.S. (Lond.), F.R.C.S. (Eng.), Surgeon to the Royal Free Hospital, Surgeon and Urologist to the South London Hospital for Women.
Size 6½ × 8½. Pp. viii + 73. With 4 Coloured Plates and 23 other Illustrations. Price 6s.; postage 5d.; abroad 9d.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

DISEASES OF THE THYROID GLAND
WITH SPECIAL REFERENCE TO THYROTOXICOSIS.
By CECIL A. JOLL, M.S., B.Sc., F.R.C.S. (Eng.).
Crown 4to. Fully Illustrated. £3 3s. net.
"Mr. Joll has presented his fellow practitioners and students with a monumental volume. They need not trouble to search the literature published up to the time this volume went to press, for they will find everything relevant within its covers."
—BRITISH JOURNAL OF SURGERY.
William Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

ELECTROCARDIOGRAPHY.
By C. C. MAHER, B.S., M.D. Pp. xiv + 250, with 45 illustrations and 95 electrocardiograms.
Price 18s. Postage 6d., abroad 1s.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

With 16 Plates. Demy 8vo. 9s. net; postage 5d.
PYELOGRAPHY:
ITS HISTORY, TECHNIQUE, USES AND DANGERS.
By ALEX E. ROCHE, M.A., M.D., M.Ch., F.R.C.S.
With an Introduction by SIR JOHN THOMSON-WALKER, F.R.C.S.
"... will be of great use ... of interest and value."—B.M.JNL.
London: H. K. Lewis & Co. Ltd., 136 Gower-street, W.C.1.

LEWIS'S BOOKS

FOURTH EDITION. With 66 Plates, including 72 Figures. Demy 8vo. 35s. net; postage 9d.
THE DERMATERGOSES OR OCCUPATIONAL AFFECTIONS OF THE SKIN.
Giving Descriptions of the Trade Processes, the Responsible Agents and their actions.
By R. PROSSER WHITE, M.D. Edin., M.R.C.S. With a Memoir by Dr. W. E. COOKE.
"... the standard textbook on the subject. ... The amount of information contained is really monumental."—LANCET.

Byrne's STUDIES ON THE PHYSIOLOGY OF THE EYE, STILL REACTION, SLEEP, DREAMS, HIBERNATION, REPRESSION, HYPNOSIS, NARCOSIS, COMA and Allied Conditions. With 48 Illustrations. Royal 8vo. 40s. net.
"... the book will be valuable."—BRITISH MEDICAL JOURNAL.

Byrne's CLINICAL STUDIES ON THE PHYSIOLOGY OF THE EYE. With 49 Illust. Demy 8vo. 10s. 6d. net; postage 6d.
"... full of interest."—BRITISH MEDICAL JOURNAL.

MacLeod's DISEASES OF THE SKIN. A Textbook for Students and Practitioners.
14 Coloured Plates and 457 Illustrations. Re-issue, with Supplement, including 22 new Illustrations. Royal 8vo. 40s. net.
"... singularly complete ..."—BRITISH MEDICAL JOURNAL.

Goodall's TEXTBOOK OF INFECTIOUS DISEASES.
Third Edition. With 26 Plates (6 Coloured), 15 Diagrams and 34 Charts. Demy 8vo. 30s. net; postage 9d.
"A valuable addition to the library of every practitioner."—LANCET.

London: H. K. LEWIS & CO. LTD., 136 Gower Street, W.C.1

BRESTOL HUMANISED CREAM

Indications.

Marasmus.
All types of Milk Modification.
Vitamin deficiency.
Tuberculosis.
Malnutrition.

Composition.

Total fats - - -	50·0%
Dextrose - - -	40·0%
Concentrated Orange Juice -	7·0%
Calorific value per ounce -	178
(Calorific value per teaspoon)	22

Brestol Humanised Cream is a blend of specially chosen fats and oils, emulsified with dextrose and Concentrated Orange Juice of tested vitamin potency. One of the oils present is a biologically tested codliver oil which ensures the presence of vitamins A and D.

The blend of fats is such that the combination is identical in its characteristics with the fat of breast milk.

	Fat of Brestol	Fat of Breast Milk
Saponification No. -	206.0	206.0
Iodine No. - -	50.0	46.0
Reichert Meissel No.	3.3	2.6
Polenske No. - -	1.7	1.6

Clinical samples of Brestol Humanised Cream will be sent on request to any Medical Practitioner.

Brestol
HUMANISED CREAM Regd. Trade Mark

COUPON

To COW & GATE LTD.,
Guildford, Surrey.

Please send me Post Free Literature and Clinical Samples of Brestol.

NAME.....

ADDRESS.....

.....

L. 9/2/35 ©835

FEBRUARY 9, 1935

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, CHEMISTRY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 5815 LONDON, SATURDAY, FEBRUARY 9, 1935 CCXXVIII

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Staphylococcus Toxoid. By D. S. MURRAY, M.B. ... 303
Staphylococcus Toxoid. By C. E. DOLMAN, M.R.C.P. 306
Wisdom Teeth and Their Complications. By C. BOWDLER HENRY, M.R.C.S., L.D.S. 133
The Deaf-Mute. By PHILIP FRANKLIN, F.R.C.S.—(*Illustrated*) .. 316
Diabetes Mellitus and the Pituitary Gland. By A. LYALL, M.R.C.P., and J. A. INNES, M.R.C.P.—(*Illustrated*) 318
Carcinoma of the Stomach with Multiple Secondary Deposits in the Colon. By T. P. LAWRENCE, F.R.C.S., and G. H. STEELE, F.R.C.S.—(*Illustrated*) 321

MEDICAL SOCIETIES

Royal Society of Medicine: Section of Laryngology: Chronic Infection of Nasal Accessory Sinuses 322
Association of Clinical Pathologists: Clinical Pathology of Pleural Fluid 324
Society of Medical Officers of Health: Cerebro-spinal Fever 325
Medical Women's Federation: Common Mental Disorders 327

REVIEWS AND NOTICES OF BOOKS

Clinical Science Illustrated by Personal Experiences. By Sir Thomas Lewis, F.R.C.P., F.R.S. 328
Physical Diagnosis. By Prof. R. C. Cabot, M.D. 328
Surgery of a General Practice. By A. E. Hertzler, M.D., and V. E. Chesky, M.D. 329
Voluntary Sterilisation. By C. P. Blacker, M.R.C.P.. 329
Clinical Studies on the Physiology of the Eye. By J. G. Byrne, M.D... 329

LEADING ARTICLES

CLINICAL SENSE AND CLINICAL SCIENCE 331
TREATMENT OF STAPHYLOCOCCAL INFECTIONS 332
ST. GEORGE'S HOSPITAL . 333

ANNOTATIONS

Diabetes Mellitus and the Pituitary 334
The Sale of Drugs in America 334
Liver Treatment in Subacute Combined Degeneration of the Cord.... 335
Industry and Occupation. 335
After-treatment of Radical Mastoid Operations..... 336
Catgut Allergy 336
Carriers of the Meningococcus 337
Digitalis and Quinidine... 337
A New Bunsen Burner.—(*Illustrated*) 338
Psychiatry in Russia..... 338
Nutrition in Brief 338

PROGNOSIS

XXXIX.—Prognosis in Schizophrenia. By AUBREY J. LEWIS, M.R.C.P. 339

SPECIAL ARTICLES

The Coroner's Inquest: Desirable Changes in Law and Practice 341
Medicine and the Law: Unsuccessful Claim against Doctor and Dentist—Unregistered Doctor and Death Certification 330
Scotland: Edinburgh Pathological Club..... 343
Liverpool Voluntary Hospitals Report..... 356

CORRESPONDENCE

St. George's Hospital (Lords Greville and Winchilsea) 345
The Purgative Action of Magnesium Salts (Dr. A. F. Hurst) 345
The Housing Bill (Mr. A. Trystan Edwards, F.R.I.B.A.) 346
The Reservoir Sign of Acute Mastoiditis (Mr. E. Watson-Williams, F.R.C.S.) 346
Left-handedness (Dr. W. S. Inman) 347
Treatment of Apparent Stillbirth (Dr. K. R. Smith and Dr. A. Turnbull) 347
Whole-time Consulting Appointments (Dr. Buckley Sharp)..... 347
The Prognosis of Tetanus (Dr. Leslie Cole) 348

PANEL AND CONTRACT PRACTICE

Temporary Residents.—Hospitals and the Drug Fund 349

PUBLIC HEALTH

The Squinting Schoolchild 349
Infectious Disease in England and Wales ... 350

OBITUARY

Harold Theodore Thompson, F.R.C.P.—(*With portrait*) 351
George Matheson Cullen, F.R.C.P. 351
James William Bond, M.D. 352

THE SERVICES

Royal Naval Medical Service.—Army Medical Services.—Royal Army Medical Corps.—Royal Air Force.—Indian Medical Service..... 344

PARLIAMENT

Notes on Current Topics: Overcrowding and Public Health.—Unemployment Relief Regulations 353
House of Commons: Malaria in Ceylon.—Road Accidents and Alcohol and Drugs.—Water-supplies.—Smoke Abatement.—Improvement of Milk-supply.—Unqualified Practitioners and Deafness.—Poor-law Relief in Scotland.—Protection against Influenza 354

MEDICAL NEWS

Roy. Coll. Phys. Lond. .. 357
University of Oxford 357
Society of Apothecaries .. 357
Extensions to Hospitals... 348
Fellowship of Medicine, &c. 348
Royal Edinburgh Hospital for Incurables 350
Liverpool Heart Hospital. 350
Inland Water Survey for Great Britain 356
Sir Alfred Fripp Memorial Fellowship 357
Medical Superintendents' Society 357
London School of Hygiene 357
Royal Society of Arts ... 357
Society of Chemical Industry 358
Institute of Medical Psychology 358
Royal Sanitary Institute.. 358
Willesden Clinic Luncheon 358
The Chadwick Gold Medal 358
University of Durham.... 358

INDEX NOTICE

THE LANCET, Vol. II., 1934 360

NOTES, COMMENTS, AND ABSTRACTS

A Northern Spa Hospital 360
New Preparations: Lactopeptine Tablets.—Redoxon..... 360

Medical Diary 358
Births, Marriages, Deaths. 359
Vacancies 359
Appointments 360

THE LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY LIMITED

(FOUNDED 1892)

President: Sir JOHN ROSE BRADFORD, Bart., K.C.M.G., C.B., C.B.E., M.D., F.R.C.P., F.R.S.

Trustees for the Reserve Fund:
Rt. Hon. LORD DAWSON, P.C., G.C.V.O., K.C.B., M.D., P.R.C.P. Sir JOHN ROSE BRADFORD, Bart., K.C.M.G., C.B., C.B.E., M.D., F.R.C.P., F.R.S. Sir SQUIRE SPRIGGE, M.D., F.R.C.P., F.R.C.S.

The Society was founded for the following purposes: To protect, support, and safeguard the character and interests of legally qualified Medical and Dental Practitioners; to advise and assist Members of the Society in matters affecting their professional character and interests; and to indemnify them in respect to actions, etc., undertaken on their behalf.

The Society is insured with Lloyd's Underwriters to an unlimited extent in respect of all adverse costs and damages awarded against Members in any action which the Society undertakes on their behalf.

Annual Subscription: £1. Entrance Fee: 10s. Assets exceed £60,000.
No entrance fee to those joining within 12 months of registration.

Full particulars and forms of application for membership from the Secretary, Victory House, Leicester Square, W.C.2.
Telephone: GERRARD 4814.

SELECTED WRITINGS *of*

JOHN HUGHLINGS JACKSON

M.D., F.R.C.P., F.R.S.

VOL. I.—EPILEPSY AND EPILEPTIFORM CONVULSIONS.
VOL. II.—EVOLUTION AND DISSOLUTION OF THE NERVOUS SYSTEM: SPEECH: VARIOUS PAPERS: ADDRESSES AND LECTURES.

Edited by JAMES TAYLOR, M.D., F.R.C.P.

With the advice and assistance of GORDON HOLMES, M.D., F.R.C.P., and F. M. R. WALSHE, M.D., F.R.C.P.

Over 500 pages in each vol. Price each 25/- net, postage extra (Inland 9d., Abroad 10d.).

"It is a rich mine of clinical observations, and should be read not only by those who are interested in neurological principles, but also by all who have to deal with epileptic patients."—*British Medical Journal.*

RADIOTHERAPY in the DISEASES OF WOMEN

By MALCOLM DONALDSON,
B.A. (Cantab.), F.R.C.S. (Eng.), M.B., Ch.B. (Cantab.),
Physician Accoucheur with Charge of Out-patients, St. Bartholomew's Hospital, Consulting Gynæcologist, Royal Northern Hospital, &c.

Demy 8vo. 148 pages. 11 illustrations in the Text; 2 Plates, one in Colour.
Price 7/6 net; postage 6d.

This book is written with the intention of giving to general practitioners an impartial view of the value of radiotherapy at the present stage of its evolution.

ANATOMY IN THE LIVING MODEL

By DAVID WATERSTON, M.A., M.D., F.R.C.S.E., F.R.S.E.,
Bute Professor of Anatomy at the University of St. Andrews

276 pages. 74 illustrations. 16 coloured plates. Price 25/- net, postage 9d.

"The author has brought to his task the fruits of a wide and long experience as well as of careful and considered thought, and has succeeded in producing a volume of much originality and suggestiveness."—*British Medical Journal.*

DIAGNOSIS OF MENTAL DEFICIENCY

By HENRY HERD, M.A., M.B., Ch.B.,
School Medical Officer, Manchester Education Committee;
Certifying Medical Officer to the Lancashire Mental Deficiency Authority.

284 pages. Demy 8vo. Fully illustrated with 39 Half-tone and 12 Line Blocks.
Price 12/6 net, postage 6d.

"A concise and practical guide to the recognition of mental deficiency on modern lines."—*Public Health.*

HODDER & STOUGHTON, LTD., *Medical Publications,*
St. Paul's House, Warwick Square - - - - LONDON, E.C.4.

ADDRESSES AND ORIGINAL ARTICLES

STAPHYLOCOCCUS TOXOID

A CLINICAL TRIAL *

By D. S. Murray, B.Sc., M.B. Glasg.
HON. PATHOLOGIST, ROYAL HOSPITAL, RICHMOND, SURREY

The demonstration of the production of highly potent toxins by various strains of staphylococci has changed to a large extent the conception of staphylococcal infections, and the further observation that the blood-serum in human beings and in animals often contains measurable amounts of the antitoxin has inevitably suggested a new line of attack on these infections.

The nature of the toxins of the staphylococci was discussed in this journal by Panton, Valentine, and Dix,[1] who gave an account of 13 cases of pyæmic staphylococcal infection which were treated with antitoxin with encouraging results. In a subsequent paper [2] the first two authors discuss the possibility of treating chronic staphylococcal infections by means of formolised toxin (or "toxoid"), and they mentioned two cases of sycosis in which this had been tried with benefit. Other papers recording favourable clinical results with toxoid in staphylococcal infections have been published by Dolman,[3] Connor and McKie,[4] and Whitby,[5] while Kindel and Costello [6] and Cornbleet and Rattner [7] have published results which were less satisfactory. The available evidence in favour of toxoid was summarised in May last year by Parish, O'Meara, and Clark,[8] who concluded from published work and their own results that the treatment was of value in subacute and chronic staphylococcal infections in man.

With the production in this country of antigenically potent toxoids in considerable quantity, it has been feasible to attempt the treatment of a number of different staphylococcal diseases by means of these products. The present paper gives the results obtained in a fairly large series of cases. This investigation has lasted nine months and was begun before the Therapeutic Trials Committee decided to make an official test of staphylococcus toxoids. It does not therefore conform exactly to the trial asked for by that committee, but does so to a large extent. In all some 150 cases have been seen, but of these a certain number proved not to be of staphylococcal origin and a number failed to attend for sufficient treatment. A total of 116 cases was adequately treated, and these form the basis of this report. The patients were of all ages from 6 weeks to 82 years, and the greater number had histories of long-standing infection. In 90 patients whose stories seemed to be reliable, the average duration of the disease had been 6½ years and the longest appeared to be 54 years. All had had various other treatments without continuous or striking benefit. Local applications, colloidal preparations of manganese or tin, vitamin concentrates, and, in a few cases, vaccines, had been tried in turn. Cultures of staphylococci were obtained from 81 of the patients, but many of the others attended for the first time when they had no fresh lesions from which suitable cultures could be made.

Presence of Circulating Antitoxin

It is now recognised that there may be present in normal blood a certain amount of circulating staphylococcus antitoxin. Throughout this trial I have estimated the amount in my cases by the method described by Parish. The potency values in the following Tables are expressed in international units of staphylococcus antitoxin (antihæmolysin) per c.cm. of patient's serum. The titration is on a 50 per cent. differences scale, and the lowest estimable amount of antitoxin is 0·4 unit. Quite a number of patients have less than this, but, in calculating averages, their values have been taken as 0·4 international unit.

The amount of "natural" antitoxin varies considerably (Table III.). For purposes of comparison I have included in each batch of tests a certain number of "normals." For this purpose I have examined sera (taken primarily for Wassermann tests) from a group of pregnant women and new-born infants. These do not vary much in their average antitoxin titre (Table I.).

TABLE I

	Cases.	Av. antitoxin.
New-born infants ..	50	0·78 unit
Pregnant women ..	50	0·75 ,,
Total	100	0·765 ,,

Various writers have given differing figures for the amount of antitoxin produced by the human body in disease; but there seems general agreement that in osteomyelitis alone is the amount greatly increased. Table II. indicates that the natural variation in antitoxin titres is of comparatively small range in the majority of superficial infections.

TABLE II

Infections	Cases.	Units per c.cm. average.
Acne	30	1·03
Blepharitis	14	0·90
Furunculosis	35	1·03
Carbuncles	8	0·60
Others	21	0·92
Total	108	0·96
Osteomyelitis	7	11·7

The difference between this group and the 100 controls does not appear to be of significance. Dolman [9] found that the average titre was low in carbuncles, and this is borne out by the low figure for the admittedly small series included above. It has been suggested that the estimation of staphylococcus antitoxin might prove to be of diagnostic value. It would appear to be so only in cases of bone infection in which there is doubt as to the causative organism. Such cases do not occur very frequently, but a brief description of two of them may be of interest in this connexion :—

CASE 166.—F., aged 34. Chronic infection of metatarsal bones with sinuses. Pus from a sinus gave a growth of *Staphylococcus albus* only and tubercle bacilli could not be found. The blood-serum showed a titre of 2 units. This was considered too low for a staphylococcal osteomyelitis. Amputation was done, and microscopic sections showed the lesion to be tuberculous.

CASE 153.—F., aged 55. Subacute infection of fourth toe and metatarsal. Blood titre was 8 units. Toe and head of metatarsal bone removed. *Staphylococcus aureus* was obtained on culture.

In Table III. the distribution of the values obtained is shown. There is a slightly larger number of higher

* A report to the Therapeutic Trials Committee of the Medical Research Council.

values among the infections, but not sufficient, in my view, to be of any importance.

TABLE III

—	Antitoxin content. Units per c.cm.		
	0·4 to 0·7	1·0	1·5 to 2
Controls	67 cases.	17 cases.	16 cases.
Infections ..	53 ,,	21 ,,	26 ,,

Increasing Circulating Antitoxin

Of the many therapeutic measures hitherto used in staphylococcal infections only vaccines can be considered specific. So far as evidence has been collected, the injection of dead staphylococci does not appear to cause any increase in the circulating antitoxin. In the few cases in my series which had recently been treated with vaccines there was no significant change in the antihæmolysin titres. It has, however, been shown by others that the amount of circulating antitoxin can be increased by injections of toxoid; and while the titres reached vary much more than in the untreated, the variations cover a different range of values.

All the patients in this series have had the same first course of injections of toxoid—viz., 0·05, 0·1, 0·2, and 0·4 c.cm. at weekly intervals, making a total of 0·75 c.cm. The blood was retested one week after the fourth dose. The maximum value found was 38 units and the average 7·6 units. Table IV. shows the difference in range and distribution of the values after 0·75 c.cm. toxoid, compared with the titres before treatment (100 cases). Two different toxoids supplied to me from the Wellcome Physiological Research Laboratories appeared to be of equal antigenic value. It seems from this series that in the chronically infected untreated case it is exceptional to get a value over 2 units, while in the treated it is unusual to get a figure lower than this.

TABLE IV

—	1·5 units or less.	2 units.	3–8 units.	11–38 units.
Before ..	89 cases.	10 cases.	1 case.	0 cases.
After ..	2 ,,	13 ,,	58 cases.	27 ,,

Average titre after 0·75 c.cm. toxoid (102 cases) = 7·6 units.

	Toxoid 8300.	Toxoid 8811.
Cases	18	20
Titre before ..	1·0 unit	0·87 unit.
Titre after ..	8·2 units	7·5 units
Increase	×8·2 ,, ...	×8·6 ,,

From these figures it appears possible to obtain with four doses an average increase in staphylococcus antitoxin of about eight times the initial value. The continued injection of toxoid, however, does not necessarily produce a continuous increase in antitoxin, and there would seem to be a limit beyond which the production of antitoxin cannot be forced (Table V.). Support to this view is given by the results in a number of cases in which, after an interval of two to four months, a second course of injections was tried. Incidentally, it will be noticed that, though the average antitoxin titre had dropped during the interval, it still far exceeded the figure before treatment. It was not possible to do all the tests on every case in the series, and the numbers under each heading are given in parentheses (Table VI.).

TABLE V

Cases.	Average antitoxin.			No increase.
	Before.	4 doses.	Complete course.	
41	0·84 unit	7 units	7·5 units	19 cases

TABLE VI

Before.	4 doses.	1st course.	Interval.	—	2nd course.
0·9 unit (38)	8·4 units (38)	8·3 units (21)		5·2 units (36)	7·5 units (25)

The figures in parentheses indicate the number of cases.

Reactions

The injection of staphylococcus toxoid produces a certain amount of local swelling and pain, but most patients speak of it as being only "stiffness." Three different batches of toxoid have been used, and they appeared to cause the same amount of reaction. Subcutaneous injection proved definitely more painful than intramuscular, and all but a few of the injections have been into the deltoid muscle. There may be an immediate "stinging" in some cases.

TABLE VII

Type of reaction.	Cases.
Local	10
General	7
Lethargy	12
Exacerbations	16

In 12 cases a curious phenomenon of extreme tiredness or lethargy for about 24 hours has been experienced. This may have been associated with a rise in temperature but in only one case was this taken. The maximum reached was 99·8° F., and it quickly subsided. The patient had already proved very sensitive to diphtheria toxoid-antitoxin. It is also of interest that 16 cases had an apparent exacerbation of their infection following, usually, the first two doses of toxoid. The number of really severe local reactions has been remarkably small. I have given over 1000 injections and have notes of only 17 causing what the patient considered a really painful arm.

Clinical Results

What effect has this artificial production of antitoxin on staphylococcal infections? It must again be emphasised that practically all the cases here considered were very chronic and had previously had various other treatments without success.

TABLE VIII

	Recovered.	Improvement.	Slight or no benefit.
Acne	3 cases	21 cases	6 cases
Blepharitis ..	8 ,, ...	6 ,, ...	1 case
Furunculosis ..	25 ,, ...	14 ,, ...	—
Carbuncles ..	3 ,, ...	1 case	—
Others	12 ,, ...	14 cases	2 cases
Total ..	51 ,, ...	56 ,,	9 ,,

So far as possible all other treatment was stopped at the beginning of the course of injections but dressings were sometimes necessary—e.g., for carbuncles. The acne cases usually continued to use

calamine lotion and the blepharitis cases such lotion or ointments as they had used for years without effect. Table VIII. shows that even with these "resistant" cases, the injections of toxoid produced alleviation of the disease in a notably large proportion of the total series.

Cases have been classed as "recovered" if fresh lesions ceased to appear during the course of injections and have not reappeared during six to eight months' subsequent observation. These results have been obtained with from 5 to 15 doses and amounts of toxoid from 0·6 to 5·9 c.cm. The chief lesion has been the one observed for the degree of improvement, but in a large number more than one lesion was present —e.g., acne and blepharitis. The cases recorded as "blepharitis" in Table VIII. are only those without obvious acne. On the other hand, in certain acne cases a coexistent blepharitis has been cured but the case is included in its appropriate place according to the degree of change in the acne. If all the acne cases are excluded, over 95 per cent. of the others showed definite amelioration of their condition. It has been impossible to subdivide the degree of improvement further. Some of those included under this heading have been very bad and very chronic cases, and the degree of improvement has been quite remarkable. The acne cases which did not improve were definitely non-pustular and only two gave cultures of staphylococci. It is hoped to try them now with an acne vaccine. The three failures, apart from acne, were: (1) an infected radium burn, (2) a patient aged 82, and (3) an obscure eye condition of 50 years' duration.

A few brief case summaries illustrate the type of case and result.

CASE 10.—M., aged 25. Blepharitis 20 years. Eyes required ointment at night and bathing in the morning to free them. Six doses, 1·55 c.cm. in all. Definitely improved after three doses. Has not used ointment or lotion since (eight months' observation).

CASE 52.—F., aged 44. Blepharitis 40 years. Eyes always sticking in the morning. After four doses—"First time for 27 years she did not need to bathe eyes in the morning." Putting on weight. Slight relapse after four months. Further improvement with second course. Thirteen doses in all, total 5·45 c.cm.

CASE 77.—F., aged 30. Furunculosis for years, chiefly of chin, occasionally elsewhere. Six doses, a total of 2·15 c.cm. given. "Best for months." No fresh lesion for five months.

CASE 24.—M., aged 27. Furunculosis 20 years. First seen with a large abscess of finger. Healed rapidly after toxoid. Six doses, a total of 1·55 c.cm. given. "Not a spot since" (six months).

CASE 70.—F., aged 23. Acne, many years. Almost entirely pustular. Five doses, a total of 1·15 c.cm. given. Five months later has only an occasional spot in place of daily crops.

CASE 83.—F., aged 25. Acne for 11 years. Mainly papular but lesions always scratched and infection spread locally. Nine doses, a total of 2·95 c.cm. "Best for years" and has maintained improvement for six months.

RELAPSES

All the patients treated up to the end of June last year were given a "rest" period, and 81 have been seen again after an interval of 2–5 months or more. Of these 81, relapses have occurred in 17. In none were the lesions as severe as formerly, and in a number the degree of relapse was very slight. Of 16 patients who have had a second course of toxoid, 13 have again improved and the remaining 3 have not yet completed the second course. In all, 38 cases have had a second course and 32 have shown improvement.

In assessing the degree of improvement a strict basis has been observed. A few patients have come to me direct or have not reported back to their own doctors, but as a rule "recovery" has been recorded only in instances where the colleague who sent in the case, the patient, and myself were all agreed about it. The patients' view of chronic staphylococcal infections is usually of evidential value, for they take a very close interest in any change.

RELATION OF CLINICAL IMPROVEMENT TO TITRE

It appears from the above figures that an increase in the circulating antitoxin is commonly associated with an improvement in the clinical condition. If the degree of clinical improvement showed complete correspondence with the rise in antitoxin titre, we should have in the latter a test of considerable prognostic value. As Table IV. shows, the treated cases have a wide range of variations in the amount of antitoxin produced. Quite early in this trial the writer was struck by the rapid clinical change in cases with a very rapid increase of antitoxin, and he aimed at reaching an increase of 10–20 times the initial figure in every case. The results given in Table V., however, suggested that this could not be achieved simply by increasing the number of injections. From a close study of the individual figures and clinical conditions, it appeared that six doses of 0·05, 0·1, 0·2, 0·4, 0·5, and 0·6 c.cm. respectively would probably yield the maximum obtainable increase in antitoxin. This is the course now adopted and a further series of about 30 cases has been treated in this way. Their antitoxin titres have not been done as it was thought worth while to judge them entirely on clinical grounds. This test is not yet complete, but so far six doses, the last two at fortnightly intervals, have proved satisfactory. A few cases have required individual consideration and departure from this routine.

As will be seen from Table IX., the increase in antitoxin titre under treatment does appear to have some prognostic value.

TABLE IX

—	Recovered.	Improved.	Slight or nil.
Before	0·96 unit	1·1 units	0·95 unit
After 4 doses ..	8·9 units	7·0 ,,	2·55 units
Increase ..	×9·0 ,,	×6·4 ,,	×2·7 ,,

Whitby considers that an increase of at least ten times should be aimed at, and one has the impression from the series of cases at present under discussion that a very favourable prognosis can be given if that increase is achieved.

TABLE X

Initial titre ..	< 0·4	0·4	0·7	1·0	1·5	2·0
Average final titre	7·8	8·0	7·0	8·4	6·9	8·7
Increase	×19+	×20	×10	×8·4	×4·6	×3·9
Recovered ..	7	7	6	12	5	4
Improved	8	5	8	6	9	6
Slight or nil ..	1	1	1	3	1	1
No. of cases ..	16	13	15	21	15	11

The proportionate increase in titre is, naturally, associated with the initial figure, but as approximately the same number of cases fall under each titre value (Table X.) the initial titre does not appear to influence the final results.

In this connexion it is also of interest that while (Table VI.) the average drop in titre during the rest interval was from 8·4 to 5·2 for the total series, in those that relapsed the fall was from 5 to 3·3.

THE PART PLAYED BY STAPHYLOCOCCUS TOXIN

A few cases have failed to improve during the first course of injections but have rapidly improved after the injections were stopped. This observation further emphasised that brought out by Table VI., and supports the claim that a course of six doses followed by a rest may be as good as, or better than, a longer series of injections. It suggests that in these cases the staphylococcus has produced a degree of toxæmia which it takes some time for the circulating antitoxin to overcome. There is evidence, now that the presence of staphylococcus toxin and antitoxin is better recognised, that even in superficial infections there may be more toxæmia than has hitherto been supposed. Of the 116 cases analysed above, 24 have offered the information that their general health has greatly improved since the injections started. In some cases the change has been obvious clinically. Gilchrist and Wilson [10] have reported a series of cases of diabetes in which the administration of staphylococcal toxoid has been followed by improvement in the diabetes, and they suggest that there may in these cases be a toxæmia from a local staphylococcal focus.

During this trial some evidence has been collected which indicates that staphylococcus toxin may produce effects not previously recognised. At the same time a number of acute infections have been treated with staphylococcus antitoxin. A combination of this with toxoid at a later stage has also been tried with interesting results. All these cases, however, are outside the scope of the present trial, and will be reported separately.

Conclusions

The variations in antitoxin titre found both in treated and untreated patients and the fact that recovery occurs at different "antitoxin levels" in those who have had toxoid raise a number of questions which will require further elucidation. From the results of the present trial it seems fair to draw the following conclusions:—

1. The amount of circulating staphylococcal antitoxin is not markedly different in the "normal" and those with chronic superficial lesions, such as furunculosis.

2. The estimation of circulating antitoxin is likely to be of diagnostic value only in obscure bone infections.

3. The amount of circulating antitoxin can readily be increased by the injection of staphylococcus toxoid.

4. The amount of antitoxin is not necessarily increased by the continued injection of toxoid beyond a certain number of doses.

5. The injections are attended with very few severe reactions.

6. The increase in circulating antitoxin is associated with clinical improvement in the majority of cases of furunculosis and the other conditions treated in this inquiry.

7. Acne does not improve to the same extent as do pure staphylococcal infections.

8. The increase in antitoxin titre under treatment is of some prognostic value.

Through the Therapeutic Trials Committee of the Medical Research Council an ample supply of staphylococcus toxoid was obtained from Dr. R. A. O'Brien (Wellcome Physiological Research Laboratories) to whom my thanks are due. I have also to thank Dr. H. J. Parish, Captain S. R. Douglas, Dr. J. R. Perdrau, and Mr. P. Hartley, D.Sc., for much assistance. I have to thank the staffs of the Royal Hospital, Richmond, and Lambeth Hospital, L.C.C., and many colleagues for sending me cases and for their encouragement.

REFERENCES

1. Panton, P. N., Valentine, F. C. O., and Dix, V. W.: THE LANCET, 1931, ii., 1180.
2. Panton, P. N., and Valentine, F. C. O.: Ibid., 1932, i., 506.
3. Dolman, C. E.: Jour. Amer. Med. Assoc., 1933, c., 1007.
4. Connor, J. I., and MacKie, M.: Brit. Jour. Derm. and Syph., 1934, xlvi., 20.
5. Whitby, L. E. H.: THE LANCET, 1934, ii., 779.
6. Kindel, J., and Costello, M. J.: Jour. Amer. Med. Assoc., 1934, cii., 1287.
7. Cornbleet, T., and Rattner, H.: Ibid., 1934, cii., 1780.
8. Parish, H. J., O'Meara, R. A. Q., and Clark, W. H. M.: THE LANCET, 1934, i., 1054.
9. Dolman, C. E.: Canad. Med. Assoc. Jour., 1934, xxx., 601.
10. Gilchrist, J. A., and Wilson, M. J.: Ibid., 1934, xxx., 353.

CLINICAL USES OF STAPHYLOCOCCUS TOXOID

BY C. E. DOLMAN, M.B., M.R.C.P. Lond., D.P.H.

RESEARCH AND CLINICAL ASSOCIATE, CONNAUGHT LABORATORIES UNIVERSITY OF TORONTO

NEARLY two years have elapsed since my preliminary report [1] on the use of staphylococcus toxoid in the treatment of human localised staphylococcic infections. The present communication reviews certain further results obtained during this interval with toxoid prepared in the Connaught Laboratories, and also comments upon the results which have been meanwhile recorded by other workers in this field.

Connor and McKie,[2] using staphyloccoccus toxoid in the treatment of sycosis and furunculosis, have confirmed my observation that an increased anti-hæmolytic titre of the serum occurs in human beings following a series of injections of toxoid, and is accompanied by clinical improvement. Their toxoid was prepared by incubating for five days at 37° C. in the presence of 0·2 per cent. formaldehyde, the pooled toxins of four strains of staphylococcus. By giving rabbits a series of subcutaneous injections of living toxigenic staphylococci, followed by injections of toxoid, they were able to establish complete immunity to massive doses of living toxigenic staphylococci introduced intravenously.

Kindel and Costello,[3] on the other hand, obtained poor results with a certain undefined preparation of toxoid in a group of 42 patients, 28 of whom had acne vulgaris, and the implied conclusion of their report was that the therapeutic usefulness of staphylococcus toxoid had been over-estimated. In criticism of their paper it has already been pointed out [4] that only one strain of staphylococcus was employed in the preparation of their filtrates, while no statement was made to indicate that the formolised final products were in any degree antigenic for either laboratory animals or man.

Parish, O'Meara, and Clark [5] have obtained favourable results in a few cases of recurrent furunculosis, by treatment with injections of staphylococcus toxoid prepared by them. Rabbits and guinea-pigs immunised with their toxoid developed a very high degree of resistance to the pyogenic lesions produced in the skin of normal control animals by intradermal injection of living staphylococci. Rabbits immunised with toxoid were found to survive many lethal doses of culture injected intravenously. Whitby [6] has reported very favourably upon the clinical value of toxoid prepared by these workers.

As the usefulness of potent staphylococcus toxoid in treatment and prophylaxis of localised staphy-

lococcal infections becomes increasingly recognised, special attention will need to be paid to the methods available for control and assay of the antigenic value of different preparations. In these laboratories pooled toxins of high potency are obtained from selected staphylococcal strains by a method fully described elsewhere.[7] To the pooled sterile toxins, formalin is added to give from 0·1 per cent. to 0·15 per cent. by weight of HCHO, and the mixture is incubated at 37° C. for about 14 days. In my earlier paper [1] figures were given for the potency of a representative pooled toxin such as might be used in the preparation of toxoid, and stringent tests for the innocuity of the detoxicated product were described, which have, with only slight modification, proved entirely satisfactory. Further, before release every preparation of toxoid has had to conform to certain standards of antigenicity which appear to have ensured the distribution of a satisfactory product. These standards of potency for the toxin, and of innocuity and antigenicity for the toxoid, will be fully discussed elsewhere in a forthcoming publication.

Cases and Results

The group of some 300 cases to be reported is comprised of patients with authenticated localised staphylococcal infection, to whom toxoid was administered either by myself, or by colleagues on the honorary and resident staffs of various hospitals who were good enough to carry out my recommendations, and to permit me to see their patients. Blood specimens were taken for staphylococcus antitoxin estimation before, and also at various times during and after the course of injections. In the Table is set out a clinical classification of the cases. The general results of treatment in each of the main types of infection will be discussed, and a few histories illustrative of special points will be briefly outlined.

Clinical Classification of 306 Cases Treated with Staphylococcus Toxoid

Diagnosis.	Number treated.
Recurrent furunculosis	81
Chronic and subacute osteomyelitis	59
Acne vulgaris	42
Convalescence from acute staphylococcal infections and toxæmias	40
Staphylococcal infection of nose, throat, and accessory nasal sinuses	23
Miscellaneous infections of skin and subcutaneous tissues	21
Recurrent abscesses	10
Carbuncle	10
Recurrent styes	9
Sycosis barbæ	4
Prostatitis	3
Staphylococcal pyelonephritis	2
Blepharitis	1
Staphylococcal pyopneumothorax	1
Total	306

RECURRENT FURUNCULOSIS

The 81 patients in this group were of all ages from 6 to 60 years, the majority being from 30 to 55 years old. Many had already failed to benefit from a wide variety of treatments, such as Stannoxyl, yeast, ultra-violet irradiation, restricted diets, autogenous and stock vaccines, and an assortment of home remedies. Twelve adults had had at least 50 successive boils over a period of from six to twelve months, while 3 among them claimed to have been afflicted with over 200, 500, and 700 boils respectively in the course of three or four years. One plan of specific treatment was closely adhered to, no special adjustment of dosage being made on account of the patient's age, or of the presence of active or developing boils at the time injections were given. With few exceptions the initial injection was 0·05 c.cm. of toxoid subcutaneously, followed by 0·1, 0·15, 0·2, 0·25, 0·3, 0·4, and 0·5 c.cm. at intervals of from five to seven days.

Clinical evidence of some acquisition of immunity was usually apparent after two or three injections. By then a crop of persistent boils had often commenced to show rapid regression; while a succession of boils might already have come to an end, or have given promise of so doing by the recurrences of infection being of diminished size and abortive type. Experience showed, however, that a minimum of six doses should be given; and the above series of eight doses was given in most instances. Estimations of the staphylococcus antitoxin content of the serum showed that the usual increase after eight consecutive injections of toxoid was of a five to ten-fold order, although twenty-fold increases or more were sometimes noted; and further showed that the first four injections usually provoked the greatest increase in circulating antitoxin. The more satisfactory clinical results which follow administration of a series of eight rather than of four injections may possibly depend upon the titre of circulating antitoxin having been thereby maintained at a requisite high level for a longer period of time.

This hypothesis is supported by the fact that nine of the very severe adult cases began to enjoy a long interval of complete freedom from boils only after receiving up to 20 injections of toxoid. Examination of the serum of such patients at the time of an early recurrence usually showed a considerable fall in the titre of staphylococcus antitoxin to have occurred since the previous estimation; though more than one of these patients developed a large boil despite the titre of circulating antitoxin being sufficiently high to connote freedom from recurrent furunculosis in the large majority of persons treated in this series. Resumption of the toxoid injections, resulting in a rise in the antitoxic titre to, or beyond, its earlier higher level, brought about an apparent clinical immunity in every patient, which has persisted uninterruptedly for from 6 to 22 months since the last dose of toxoid.

The ultimate duration of this immunity to recurrent furunculosis is open to question. Of the patients still traceable, all but three who responded satisfactorily to the original series of six to eight injections of toxoid, and who therefore received no subsequent injections, have remained free from recurrences for various periods up to two years since treatment. The antitoxin titres of the sera of these three patients, on their return with a fresh boil after many months' freedom from infection, had reverted to the original low figures. A series of four to six doses of toxoid again brought about a marked increase in circulating antitoxin and since then clinical immunity has persisted. The nine relapsing cases considered in the preceding paragraph may be analogous to the last-mentioned three cases, in that recurrences in each group may be correlated with a fall (too early or too precipitate) in the titre of circulating staphylococcus antitoxin.

But it is noteworthy that each of the nine intractable patients proved to be carrying toxigenic staphylococci in pure or predominating culture in their anterior nares. Attention was drawn to this possiblity because of signs and symptoms of nasal sinusitis, or of frequent colds associated with pustules around the nose and

mouth in some of the cases. Swabs taken from both nostrils of these patients, as well as from three in the group who showed no evidence of rhinitis or sinusitis, repeatedly yielded almost pure cultures of toxigenic staphylococci when directly transferred to a blood-agar plate. The acquired protection against small numbers of staphylococci fortuitously encountered, which in the patient of average susceptibility appears to depend upon production of a five to tenfold increase in the titre of circulating staphylococcus antitoxin, may well prove inadequate in a patient of the type described above, who is liable, until warned, to inoculate his skin with large numbers of staphylococci derived from the nose. Danbolt [8] in a recent thesis has emphasised the importance of this source of staphylococcal auto-infection.

The staphylococcus antitoxin titre of patients with recurrent furunculosis before institution of toxoid treatment has usually been within average normal limits. That is, as was pointed out in my previous paper,[1] no marked increase in circulating antitoxin appears as a rule to be provoked by a series of boils. Three patients who claimed to have counted hundreds of boils on their persons showed only 0·4, 0·75, and 0·8 standard unit before receiving toxoid.* The maximum titres subsequently attained by these patients were 6·5, 3·0, and 7·5 standard units respectively.

CHRONIC AND SUBACUTE OSTEOMYELITIS

This group chiefly consisted of children with chronic or recurrent migratory osteomyelitis, many of whom received their staphylococcus toxoid at the Hospital for Sick Children, Toronto. I am indebted to Dr. D. E. Robertson, chief of surgery, for sanctioning the investigation, and to Dr. W. S. Keith and Dr. M. Mitchell for their coöperation. Certain inherent characteristics of this disease make the results of treatment with staphylococcus toxoid difficult to assess. Osteomyelitic foci undergo spontaneous changes in the amount and type of discharge from sinuses and in granulation tissue formation; while in long-standing cases the duration of remissions between acute or subacute exacerbations and the frequency of recurrence of migratory infection in any one individual are inconstant and unpredictable. Further, the common presence of dead or dying bone, and of epithelialised tracts, tends to obscure if not to prevent any beneficial local effects which might derive from the injections of toxoid. Despite all these difficulties, distinctly favourable results appear in general to attend the use of staphylococcus toxoid in chronic osteomyelitis.

The first two or three doses of toxoid were usually followed by an increased discharge of pus from the osteomyelitic focus, but the discharge later tended to diminish. In a few children with several years' history of chronic osteomyelitis, one or more discharging sinuses healed over for the first time during or soon after administration of a course of eight injections, and there have since been no recurrences. In other instances, sinuses healed following toxoid treatment, but broke down again after a few weeks. The general health of all the children appeared to be definitely benefited. Their appetite and colour improved, many of them put on considerable weight, and the nursing staff reported that those under treatment expressed eagerness to continue with the injections, and were more alert and cheerful.

In a few adults with chronic osteomyelitis of long-standing very striking local improvement occurred; other similar cases showed little change. In three instances it became possible to retain a limb which had been threatened with amputation. In some instances of well-localised subacute osteomyelitis, diagnosed at an early stage, the infection rapidly subsided when toxoid was given; in other more advanced cases surgical drainage was done, but the toxoid injections seemed definitely to accelerate convalescence.

The sera of patients in this group showed some remarkably high staphylococcus antitoxin titres. Almost invariably the initial titre was above normal, and children with recurrent migratory osteomyelitis commonly had 5–6 standard units, and in a few instances over 10 units. Yet a five or tenfold increase in the titre of circulating antitoxin could usually be produced in these patients. Two children with recurrent osteomyelitis of several years duration showed 50 and 60 standard units respectively in their serum a few days after a fourth dose of toxoid. Such very high titres were, however, not long maintained; and in general, the higher the titre, the more precipitately it fell to a lower, more stable level, upon cessation of the toxoid injections.

ACNE VULGARIS

Staphylococcus albus may usually be grown from the pus expressed from acne pustules. *Aureus* strains are less often obtained, but may be isolated from the furuncles which are liable sporadically to appear in this disease. Since even non-hæmolytic, non-pigmented, strains of staphylococcus produce measurable, though small, amounts of exotoxin, benefit might be expected to result from the treatment of pustular acne by a series of injections of staphylococcus toxoid. But as is well known, anaerobic culture of a comedone generally yields the acne bacillus, which almost certainly plays a rôle in the ætiology of acne vulgaris. The results following treatment with toxoid support the hypothesis that *Staphylococcus albus* and the acne bacillus act symbiotically as the specific cause of acne vulgaris, the pustular features of the disease being primarily due to staphylococci and the red papules to acne bacilli.

After a few injections of toxoid less pustulation occurred, while the lesions became fewer in number, and underwent more rapid development and retrogression. In patients who had periodically developed a few small pustules without the characteristic surrounding areas of red induration, eight doses of toxoid in general promoted freedom from recurrences. In the worst types with pustules and red lumps of various sizes distributed over the face, neck, and shoulders, pustulation usually ceased, but papules continued to develop. Administration of further amounts of toxoid, up to 1·0 c.cm. per dose, led to no additional improvement in a few of these patients; but the majority showed a gradual diminution in the number of red papules, and several very bad cases could legitimately be classed as cured after some 20 doses of toxoid had been given. The accompanying psychological changes in such patients were very striking.

Combined injections of staphylococcus toxoid and of an autogenous acne bacillus vaccine would seem to merit careful investigation as a mode of treatment for this stubborn complaint.

* Before the recent acceptance of an international standard unit of staphylococcus antitoxin by the League of Nations Permanent Commission on Biological Standardisation, it was customary to express a serum's content of staphylococcus antitoxin in terms of antihæmolytic units. Taking 1 standard unit as roughly equivalent to 100 antihæmolytic units, the figures for "normal" human sera usually range from ½ to 1 standard unit.

CONVALESCENCE FROM ACUTE STAPHYLOCOCCAL INFECTIONS AND TOXÆMIAS

Reference was made in a former publication [9] to the use of toxoid in provoking active antitoxic immunity during convalescence from severe and generalised staphylococcal infections and toxæmias which had been treated during the acute and critical stages by administration of antitoxic horse serum. Since maintenance of a high titre of circulating staphylococcus antitoxin throughout convalescence has seemed to accelerate the processes of repair of damaged tissues, and to lessen the risk of recurrences of infection, it has been customarily recommended that a course of toxoid injections should be given to convalescents from acute carbuncle, osteomyelitis, staphylococcæmia, and other severe staphylococcal infections, as soon as they appeared sufficiently recovered to make a serological response to injections of this active antigen. The appropriate time for beginning a course of toxoid was not considered to have been reached until the high fever had abated and other symptoms of acute toxæmia were no longer manifest, and until all deep pyogenic foci had been drained.

Although cases of severe and generalised staphylococcal infection may spontaneously develop a high titre of circulating antitoxin, there is often a critical delay in its development; and more superficial types of infection such as an acute carbuncle, may provide little or no effective antigenic stimulus. Further, as was noted when discussing the treatment of chronic osteomyelitics whose sera usually show high titres of circulating antitoxin, still higher titres may, with advantage to the local and general condition of the patients, be provoked by injections of toxoid.

STAPHYLOCOCCAL INFECTIONS OF THROAT, NOSE, AND ACCESSORY NASAL SINUSES

Although the part played by infection of such foci as the accessory nasal sinuses, the tonsils, and the teeth in the production of a wide variety of morbid symptoms is sufficiently appreciated, the frequency of staphylococcal infection of these sites is not generally realised. The ubiquity of staphylococci is more widely known than the multiplex toxigenic powers of many strains. A pure or almost pure culture of hæmolytic staphylococcus obtained by direct inoculation of a blood-agar plate with a nose or throat swab is a finding which should neither be ignored as due to "contamination" nor dismissed as of no pathological significance; particularly when swabs taken at intervals yield consistently the same growth.† In a healthy person such a finding indicates a potential source of staphylococcal infection to himself and others, while in a patient with existing symptoms of infection of the nose and throat, the probable causal micro-organism is thus made evident.

Among the characteristic local symptoms of staphylococcal sinusitis were frequent headaches, a sense of pressure or stuffiness in the head, and discharge of pus into the nose or down the pharynx; all of these being subject at intervals to sudden exacerbation. Toxæmic symptoms were often very conspicuous, general lassitude, inability to concentrate, and ready fatiguability being common complaints. Sleep was liable to be troubled and unrefreshing, patients looked pale and unhealthy, and some showed definite anæmia. While these symptoms may be present in severe sinusitis due to other micro-organisms, in some 9 out of 12 patients on whom many radical operations had been performed, and who had since become almost incapacitated, the infection proved to be staphylococcal. Certain of these patients presented additional symptoms which one would hardly have associated with staphylococcal sinusitis if treatment with toxoid had not alleviated them. Two patients had, for instance, developed severe asthma since the onset of their sinusitis, two had periodic attacks of abdominal pain diagnosed as due to pylorospasm, and three others had multiple rheumatic pains.

Apart from the above group of 9 very severe cases, there were 13 others who had received no surgical treatment, whose chief complaint was an undue susceptibility to infection of the upper respiratory tract, resulting in recurrent heavy colds with marked systemic disturbances. Most of this group had a constantly excessive nasal discharge, while 3 reported that small pustules developed frequently around the nose and upper lip.

Before completion of a series of eight doses of toxoid a very striking improvement had occurred in many of these patients. The discharge had greatly lessened, local discomfort had diminished, mental and physical vigour had been regained, their colour was better, and their sleep more restful. The patients with the asthmatic, gastro-intestinal, and rheumatic symptoms referred to above reported their alleviation; while those whose chief complaint had been severe recurrent colds enjoyed a degree of freedom from this type of infection which some had not known for years.‡

Despite the clinical improvement, the bacteriological findings were in general little changed. The definite early benefit resulting from toxoid immunisation in this type of case cannot be ascribed to elimination of the staphylococcal infection, but presumably derives from the increased titre of circulating staphylococcus antitoxin. With the help of such conservative surgical procedures as may be necessary to ensure adequate drainage, ultimate elimination of the staphylococcal infection through phagocytosis may perhaps be anticipated if the antitoxin titre of the blood of these patients be meanwhile maintained at a high level.

The variations in the duration of freedom from symptoms of sinusitis after completion of the first course of toxoid injections, in the rate of loss of acquired staphylococcus antitoxin from the blood stream, and in the serological and clinical responses to subsequent injections of the antigen, were similar to those noted under treatment of furunculosis. For those patients who remain free from recrudescences so long as their antitoxin titre remains above a certain figure (e.g., 3 units) antitoxin estimations at intervals will indicate when a few supplementary injections of toxoid are advisable. For those who rapidly lose acquired antitoxin, and become again liable to active infection, a subcutaneous injection of 0·1 or 0·2 c.cm. of toxoid every two or three weeks has proved a satisfactory method of maintaining a sufficiently high titre.

† Staphylococcal infection of the throat may locally simulate conditions as diverse as streptococcal and diphtheritic throats. Recently through the kindness of Dr. K. Welsh, Toronto General Hospital, I saw a man of 60, convalescent from prostatectomy, who had developed a mild fever and a sore throat several days before. The pillars of the fauces, the edges of the soft palate, and the upper part of the uvula, were covered by a grey membrane. The posterior pharyngeal wall was acutely injected, and the lower portion of the uvula had ulcerated away. Swabs from the membrane had yielded a pure culture of staphylococcus hæmolyticus.

‡ I am indebted to Dr. A. H. Spohn, Vancouver, for carefully kept records of several children with staphylococcal infection of their upper respiratory passages, whose susceptibility to acute recurrent colds, and in some cases to asthma, ceased after a course of toxoid.

A few case-histories will illustrate certain of the points discussed in the last paragraphs.

CASE 1. *Recurrent staphylococcal abscesses of throat.*—Woman, aged 40, following tonsillectomy several years ago submitted to a series of operations apparently designed to remove every trace of lymphoid tissue from her throat. First seen over two years ago, when she had for two and a half years been subject to recurrent painful abscesses in the region of the pillars of the fauces. These had developed regularly every two months coincident with alternate menstrual periods. From the last abscess, which discharged about one week before patient was referred for treatment, a pure culture of hæmolytic *Staphylococcus aureus* had been isolated. This produced a toxin of about 2000 hæmolytic units per c.cm. Patient's serum showed an antitoxin content of only about ¼ standard unit. After eight doses of toxoid, the circulating antitoxin had increased to about 4 standard units. Since then until now, two years later, the patient has only had two small throat abscesses, pus from which at the time of rupture grew almost a pure culture of *Streptococcus viridans*. Regular estimations of the antitoxin content of the blood have been made, and a few injections of toxoid have been given whenever the titre threatened to fall below 2 units. Throat swabs taken on several occasions from this patient did not grow toxigenic staphylococci in significant numbers, and hence some other possible source of her former recurrent staphylococcal infections was sought. Nasal swabs grew pure cultures of hæmolytic *Staph. aureus*. Inquiry elicited that the patient's nose was frequently sore, and that she had formerly been able always to foretell an oncoming ulcer of the throat by an increased soreness passing back from the nose to the pharynx.

CASE 2. *Severe recurrent colds with staphylococcal sinusitis.*—Woman, aged 27, always subject to severe colds every winter since tonsillectomy ten years earlier. When first seen nearly two years ago had suffered from continuous catarrh for several months, and for the two past weeks had been in bed with an acute antrum infection. Each exacerbation of infection in the nose was followed by pharyngitis and bronchitis. Rheumatic pains in joints lately.

A lump of thick yellow muco-pus expelled from the nose grew a pure culture of *Staph. aureus hæmolyticus*. Patient's serum contained about 1·5 antitoxin units. She noted definite improvement in her nasal condition and general health after the second dose. When six doses had been given the blood-serum contained about 10 units, no catarrh was present, and the patient's general health was remarkably better. Over three months later her antitoxin titre was still at a high level. One year later patient was reported to be still well.

CASE 3. *Staphylococcal sinusitis with asthma.*—Woman, aged 46, first seen two years ago, with history of having had a series of radical operations on "all her sinuses" during the preceding 18 years. The local infections had become worse after each operation, and she had grown increasingly susceptible to respiratory tract infections, so that it was now usual for a flare-up of sinusitis to start a sequence of pharyngitis, laryngitis, bronchitis, and occasionally patchy broncho-pneumonia. Further she appeared to have become sensitised to a number of allergens, being prone to severe asthma in the winter months, and to hay-fever in summer. But the asthma and hay-fever were only troublesome after a recrudescence of the nasal infection. The asthmatic attacks had weakened the heart, and during the winter months the patient was frequently confined to bed, and rarely left the house. Four years before toxoid treatment began, the infection in the sinuses had been shown to be staphylococcal, and an autogenous vaccine had been administered, without any resulting benefit.

Throat and nose swabs grew predominantly a hæmolytic *Staph. albus*, which produced toxin of potency 2000 hæmolytic units per c.cm. Patient's serum contained 1·5 units of antitoxin per c.cm. Very marked improvement followed a series of doses of toxoid. Twice a year since then, a series of six or so supplementary injections of toxoid have been given and this treatment is believed to have kept the patient free from all but minor respiratory infections, as well as from asthma and hay-fever, during the past 16 months.

CASE 4. *Staphylococcal maxillary sinusitis.*—Male, aged 20, liable to attacks of double maxillary sinusitis at any time of the year. Had "radical sinus operations" done three years ago and again two years ago, and since the latter occasion his antra had been washed out regularly thrice weekly. He appeared toxic and anæmic. Could not sleep for several hours on going to bed, but was roused with difficulty in the mornings. Had constant headaches, and was unable to take either mental or physical exercise. Though intelligent, his inability to concentrate had retarded his studies. Usually had a rather free discharge from nose. Pus obtained with careful technique by a rhinologist from the antrum gave a pure culture of hæmolytic staphylococcus from which toxin of 400 hæmolytic units per c.cm. could be prepared. Blood-serum showed 0·6 unit of antitoxin per c.cm. After four doses of toxoid, a fivefold increase in circulating antitoxin had occurred and the patient already appeared an entirely different person. The course of eight doses was completed and the remarkable improvement has been maintained to date, one year after treatment.

CASE 5. *Staphylococcal rhinitis with cellulitis and carbuncle.*—Male, aged 60, a physician, came recently to have the staphylococcus antitoxin content of his blood estimated because he had developed a large carbuncle on his back. The antitoxin content proved to be $< 0{\cdot}1$ unit. As a student he had suffered a sequence of many boils on his neck but in the meantime had been free from them. A year or two ago had acute cellulitis of the throat which spread like an erysipelatous infection over his neck and head and finally presented under the chin. On incision staphylococcal pus was obtained. This history and the knowledge that two tuberculous patients under his care had developed staphylococcal pyopneumothorax, led to elicitation of the fact that for some years there had been a clear mucoid secretion from the right nostril, several drops a day. Further, whenever patient caught a bad cold, small pustules were liable to break out around his nose and mouth. Swabs from right nostril grew toxigenic staphylococci in pure culture.

MISCELLANEOUS INFECTIONS OF SKIN AND SUBCUTANEOUS TISSUES

Seven of the cases in this group were emaciated and dystrophic infants aged from 1 to 3 months, with a generalised pustular eruption. The infants received a full course of eight subcutaneous injections of staphylococcus toxoid at the Hospital for Sick Children, Toronto, under the supervision of Dr. N. E. Silverthorne, to whom I am indebted for coöperation. They all eventually became free from pustules but only in one case, where a forty-fold increase in circulating staphylococcus antitoxin occurred, did the toxoid bring about a rapid recovery. Three other infants showed no marked improvement until some weeks after the toxoid injections were completed, despite four, five, and tenfold increases respectively in the antitoxin content of the serum.‖ Among the remaining patients in this group of miscellaneous skin infections were two with extensive burns in which staphylococcal infection appeared to be hindering skin grafts from taking. Definite but not dramatic improvement occurred as an increased titre of antitoxin was induced by injections of toxoid.

There were in this group four adults with patches of scaly erythema and occasional pustules on the face or hands. No convincing evidence of coccogenic ætiology was obtained but the condition of two of the patients was greatly improved following toxoid

‖ Contrasting with these results, Dr. E. B. Carder has kindly supplied records of seven infants treated with toxoid at the infant's hospital department of the Vancouver General Hospital. Since no antitoxin assays were done either before or after toxoid, these infants have not been included in Table I. All were suffering from furunculosis, two from a severe and intractable form. Their infection became rapidly arrested during a series of eight injections of toxoid, and four months later there had been no recurrences. This was an older and more robust group of infants, the ages ranging from 2 to 19 months.

injections. Among the remaining miscellaneous cases treated were a middle-aged woman with diabetic gangrene of the great toe and tenosynovitis; a male with an infected scalp wound; and two males with multiple spreading ulcers of the chest wall and legs respectively in which peripherally spreading necrosis was the most striking characteristic. All of these cases and particularly the two latter ones (which had completely resisted various treatments for several months) healed satisfactorily after a series of toxoid injections.

RECURRENT ABSCESSES

This group included four cases of recurrent axillary abscesses, three of them in young women; a persistent indolent abscess of the neck and loin respectively in two young men; and four cases of recurrent staphylococcal abscesses of deep soft tissues in adults. The indolent abscesses healed and long series of recurrent abscesses ceased following a course of toxoid injections. Two case-histories exemplifying this group will be given.

CASE 6. *Recurrent axillary abscesses.*—Woman, aged 30, referred for treatment by Dr. H. C. Cruikshank. History of recurring abscesses under axillæ. For three and a half years these had appeared at an average interval of four to five weeks, two months being the maximum interval. Usually appearing under alternate axillæ, as much as a "cupfull" of pus was obtained from some of the bigger abscesses. There had also been one boil on the breast, and several styes about two years before first seen. Excision of the lymphatic glands in the axillæ had been advocated. The last abscess had ruptured two weeks before patient was seen. Serum contained 0·6 antitoxin unit per c.cm. After four doses of toxoid the figure had risen to 4 units, and after eight doses to 7 units. From the time of commencing this series of toxoid injections until the present, over two years later, there has been no further staphylococcal infection of any kind. Although no supplementary injections of toxoid have been given, the titre of circulating antitoxin is now 2 units.

CASE 7. *Recurrent staphylococcal abscesses of deep tissues.*—Male, aged 20, scratched his elbow at work three and a half years ago and staphylococcal cellulitis developed. He received surgical treatment at Toronto General Hospital and was discharged convalescent. Returning to hospital soon afterwards with an acute illness, repeated blood cultures grew *Staph. aureus*, and an abscess ultimately presented near the ischial tuberosity. Patient made an unexpected recovery and was again discharged from hospital three weeks later. There followed during the next 13 months a series of staphylococcal abscesses which all required drainage. Osteomyelitis was never demonstrated. There was suppurative lymphadenitis of the groin which after drainage left a persistent sinus leading to bare bone; then abscesses presented in succession on dorsum of foot, over fibula, deep to rhomboid muscles, and over wrist. Staphylococcus toxoid injections were now begun, the initial antitoxin content of the blood being 1·2 units. On completion of the series of eight doses, the circulating antitoxin had risen to 8 units, the patient's general health was greatly improved, no further abscesses had developed, and the sinus in the groin had begun to granulate. Six months later patient was able to return to work completely healed. No abscesses have developed during the two and a half years since the original toxoid treatment, although no supplementary injections have been given. The present titre of circulating antitoxin is about 2 units. I am indebted to Dr. J. H. Couch for permission to report this case.

CARBUNCLE

As was pointed out in a former paper,[9] a patient acutely ill with carbuncle should receive staphylococcus antitoxin serum. But not uncommonly a large carbuncle may develop with few signs of general toxæmia, and in certain sites with surprisingly little local discomfort. These cases may with advantage be spared the unpleasantness of serum-therapy, and may be actively immunised instead with toxoid injections. Localisation with discharge of pus in an indolent carbuncle, and accelerated granulation and healing in a carbuncle which has already been discharging pus for some time, are often to be noted very soon after the first dose or two of toxoid.

RECURRENT STYES

This condition responds promptly to injections of toxoid. Children and adults susceptible for many years to recurrent styes, and to considerable systemic disturbance resulting therefrom, ceased having this type of infection after administration of toxoid.

SYCOSIS BARBÆ

While this intractable condition may be greatly benefited by toxoid treatment, none of the four severe cases treated remained for long altogether free from lesions. In each case during the first course of eight injections most of the lesions healed, but a few sporadic indolent pustules remained. This state of relative freedom persisted for from two to six months and then a relapse occurred. Resumption of toxoid injections again brought about marked clinical improvement, but a further recrudescence followed in due course. One of these patients who received repeated series of toxoid injections suffered a relapse when his blood antitoxin fell below 4 units, and improved as it rose to between 6 and 8 units.

PROSTATITIS, PYELONEPHRITIS, PYOPNEUMOTHORAX, AND BLEPHARITIS

Few conclusions can be drawn in regard to the value of toxoid treatment for these conditions, in view of the small number of cases of each type treated, and of the mixed nature of the infection in the patients with prostatitis and blepharitis. A brief account follows of two interesting cases, one of pyelonephritis in a middle-aged man, and the other of pyopneumothorax in a young woman, in which the infection was staphylococcal.

CASE 9. *Repeated abscesses and staphylococcal pyelonephritis.*—Following an attack of influenza and bronchopneumonia, a middle-aged male patient (who had previously been in robust health) developed within two weeks a succession of seven staphylococcal abscesses on hands, legs, and lower jaw. At the end of this time specimens of urine showed abundant pus cells, a few red blood cells, occasional granular casts, and epithelial cells; and on culture grew *Staph. aureus*. Temperature range 101°–102°. A specialist's opinion had been that the kidney condition under favourable circumstances would take six months to heal.

The first dose of a series of eight injections of toxoid was then given, the initial antitoxin content of the blood being only about 0·08 unit. After four doses of toxoid the blood antitoxin had risen to 11 units, the patient's condition had greatly improved, and temperature was normal. After eight doses there were 15 units of circulating antitoxin, and at this time, only six weeks after specific treatment began, the urine contained no albumin, no casts, no red blood-cells, and only a very occasional pus cell. The patient remained free from abscesses, returned to work about two months later, and has since remained in good health. I am indebted to Dr. W. W. Dow for details of this case.

CASE 10. *Staphylococcal pyopneumothorax.*—A young woman, in bed for some months with quiescent pulmonary tuberculosis, felt unwell and developed a mild fever a day or two after a refill of her pneumothorax. There had been for some time past a slight local effusion which was clear and grew *Bacillus tuberculosis*. On aspiration this was now found to be turbid, and grew staphylococci "of

mildly hæmolytic type." Her serum contained 0·7 antitoxin unit per c.cm. After a course of eight injections of toxoid the antitoxin titre was 40 units, patient had become afebrile again, and staphylococci could no longer be grown from the effusion fluid. There had been no return of infection eight months later.

Reactions

The statements in my earlier paper regarding local and general reactions need amplification. In many patients reactions are so slight as to pass almost unnoticed. In others a bright red, circumscribed patch appears at the site of injection within 8–12 hours, reaches its maximum extent in 24–36 hours, and then rapidly fades so that usually no trace remains after three days. The area is tender, but not as a rule painful. About 10 per cent. of patients have mild headache, dizziness, or nausea, and feel tired on the day following the first few injections. More severe local and general reactions have only very occasionally been noted in which swelling of the arm occurred, while the patients had a slight fever and felt quite ill for a day or two. This type of reaction seems to be relatively more frequent in patients with staphylococcal sinusitis.

The reactions following the first few injections are apt to be the more troublesome, but they bear no relationship to the patient's titre of circulating staphylococcus antitoxin at the time. As with diphtheria toxoid, the more severe reactions occur in adults, children in general experiencing little discomfort, while infants display none. The tolerance which adults develop to the later doses is soon lost. After the lapse of more than one month since the last preceding dose of toxoid, the initial dose of any supplementary course of injections should not exceed 0·1 c.cm.

About ten thousand patients are estimated to have received a total of nearly 100,000 injections of staphylococcus toxoid prepared in the Connaught Laboratories. In my own series the age limits were 2 months and 89 years, and no alarming reactions have occurred. Focal reactions following staphylococcus toxoid injections are quite inconspicuous, and no serious reaction of this type has yet been reported.

Comment

Potent preparations of staphylococcus toxoid would appear to be safe and efficacious antigens for use in the treatment of various localised staphylococcal infections. From the written and verbal reports received, the favourable results recorded in this personally observed series of 306 patients (almost all of whom represented severe cases of their type) seem, with few exceptions, to have been experienced by others using the same preparations of toxoid. In former publications,[1 9] consideration has been given to the possible means whereby an increased titre of circulating antitoxin generally results in an increased resistance to staphylococcal infection, and it is not proposed to recapitulate.

The undetermined amounts of dissolved bacterial substances present in staphylococcus toxoids seem unlikely to contribute to any significant degree to the therapeutic efficacy of these products. On the other hand, the good results sometimes obtained with staphylococcus vaccines are probably due chiefly to the toxin or toxoid present in the particular vaccine used. The average staphylococcus vaccine, stock or autogenous, is greatly inferior to a potent toxoid as an immunising agent, and hence presumably lacks the essential antigens. I have frequently noted that patients with a long series of multiple and recurrent boils, treated without benefit with staphylococcus vaccine, have shown a titre of circulating antitoxin which was little if at all above the average. But a few injections of toxoid in such patients brought about apparent clinical immunity and a definitely increased antitoxin titre.

A woman with continuous recurrent boils for two years, treated to no avail with 39 injections of staphylococcus vaccines, showed a titre of 1·5 standard units. After seven doses of toxoid, the antitoxin titre was 4 standard units and she became free from boils following the second dose.

That a disappointing result is occasionally given even by potent preparations of toxoid must be admitted. The point has been made already that the pathological changes in the tissues in chronic osteomyelitis and in nasal sinusitis, and the double nature of the infection in acne vulgaris, may alone suffice to prevent a complete cure, despite the possible induction of very high titres of circulating antitoxin. Moreover the degree of acquired immunity or resistance to any specific infection should properly be regarded as relative rather than absolute, and as liable to break down if contact with the causal micro-organism be sufficiently frequent, intimate, and intensive. It follows that a patient with, for instance, recurrent furunculosis, whose nasal mucous membrane carries large numbers of toxigenic staphylococci, will probably require, in order to gain clinical immunity, a particularly high titre of circulating antitoxin to be maintained for some time. There is no definite minimum amount of antitoxin whose retention in the blood stream will guarantee immunity to staphylococcal infection.

Other factors which no doubt exert considerable influence upon the duration of artificially induced immunity to staphylococcal infection are the rates of increase or of decrease in the staphylococcus antitoxin titre of the blood-serum, which are found to vary greatly in different individuals, and the rates of acquisition or of loss of antitoxin by the tissue cells. It is noteworthy that recurrences of staphylococcal infection, coincident with a significant fall in the titre of circulating antitoxin, often follow undue physical or mental fatigue, a bout of insomnia, or the onset of some intercurrent infection. Though immunity and susceptibility to staphylococcal infection are not believed to be wholly explicable in terms of serological reactions, in particular of the antitoxin titre, yet it would appear that valuable information bearing on these problems should be sought by further investigations of the type reported in this paper.

Summary

1. Staphylococcus toxoid of controlled potency proved exceedingly useful in the treatment of 306 closely followed severe cases of various types of localised staphylococcal infection. In 81 patients with recurrent furunculosis, many of whom had been intractable to various treatments, including vaccines, excellent results were ultimately obtained by means of toxoid. In 59 patients with chronic or subacute osteomyelitis, and 42 patients with acne vulgaris, the results following toxoid therapy were very encouraging, having regard to the special difficulties which arise in this type of infection. Active antitoxic immunity was with advantage provoked, by means of toxoid, in 40 cases convalescing from acute staphylococcal infections and toxæmias.

2. Special consideration has been given to the significance of staphylococcal infection of the throat, nose, and accessory nasal sinuses; and emphasis is

laid upon the probability that in intractable cases of recurrent boils, infection may result from auto-inoculation of staphylococci carried in the nose.

3. The acquisition of clinical immunity could be correlated with an increased staphylococcus antitoxin titre of the serum; and in general a return of infection occurred only after there had been a considerable fall in the titre of circulating antitoxin. There is, however, no minimum antitoxin titre whose attainment can be said to confer absolute clinical immunity to staphylococcal infection upon all patients.

4. Staphylococcus toxoid has been used very extensively during the past two years in Canada. Reactions attending its use have rarely been troublesome, and the clinical results obtained have in general corresponded to those reported in this series.

REFERENCES

1. Dolman, C. E.: Jour. Amer. Med. Assoc., 1933, c., 1007.
2. Connor, J. I., and McKie, M.: Brit. Jour. Derm. and Syph., 1934, xlvi., 20.
3. Kindel, D. J., and Costello, M. J.: Jour. Amer. Med. Assoc., 1934, cii., 1287.
4. Dolman: Ibid., 1934, cii., 1699.
5. Parish, H. J., O'Meara, R. A. Q., and Clark, W. H. M.: THE LANCET, 1934, i., 1054.
6. Whitby, L. E. H.: Ibid., 1934, ii., 779.
7. Dolman: Jour. Infect. Dis., 1934, lv., 172.
8. Danbolt, N.: Skrifter utgitt av Det Norske Videnskaps-Akademi i Oslo, I. Mat., Naturv. Klass., 1931, No. 10.
9. Dolman: Canad. Med. Assoc. Jour., 1934, xxx., 601; 1934, xxxi., 1 and 130.

WISDOM TEETH AND THEIR COMPLICATIONS*

BY C. BOWDLER HENRY, M.R.C.S. Eng., L.D.S.

DENTAL SURGEON AND LATE LECTURER IN ORAL SURGERY, ROYAL DENTAL HOSPITAL

THE complications attending the mal-eruption of the third molar (or wisdom) teeth vary from minor discomforts to very grave illnesses, and even to death. I have been much impressed by the multitude and severity of these mishaps as I have encountered them in my practice, and my object in this research is to ascertain the incidence of complications and the best way of treating them when they arise and, preferably, of preventing them at an earlier stage in their development. Before delivering my Arris and Gale lecture last February I appealed to my colleagues for cases out of their private records. I had received 311 reports when I gave my lecture, and I have received more since. I hope to bring the total to 350 by the time I publish my monograph. Side by side with these I now place 311 cases from the literature for comparison. This number will also be increased to 350 eventually to make a total of 700 cases. It must be emphasised that these figures have no real statistical value, as I can only record the information available either from private case notes or from published articles often written from quite a different point of view, and although I have tried by correspondence to ensure uniformity of record in the contributed series, it is impossible to correspond with the authors of the articles, as the range extends over the whole world. Nevertheless the positive information available has value in showing that in a certain number of cases these symptoms undoubtedly presented themselves and were considered worthy of record; the fact that they may also have appeared in other cases without being recorded does not detract from the impressiveness of the tale of suffering that the figures set out.

There is no sex differentiation. I have records of 293 males and 285 females. No age is exempt; both my private records and the published cases start at 14 and end at 84. The literature yielded records of no less than 75 patients who were aged 40 or over before their wisdom teeth troubled them. Several of them had been edentulous for many years when the last molars began to make themselves felt. The commonest period for symptoms to make their appearance is during the third decade of life, 38 per cent. of the literature series having been between 20 and 30. The lower jaw is much more frequently affected than the upper, and the left lower seems to be more often troubled than the right lower, though the difference here is less significant.

The symptoms fall into two main groups. The first contains those which are attributable to pressure or reflex irritation. This may make itself felt through local nerves or the tooth may actually impinge on the second molar and irritate its pulp, causing toothache or neuralgia. The second group is the large group associated with pronounced and sometimes fatal septic infection. This may again be subdivided according to whether the symptoms appeared spontaneously or followed an attempt at extraction. There is evidence not only of the danger of prolonged attempts with the resulting trauma but also of grave risk from a perfectly simple extraction when this is made through a septic area.

The French writers, who have devoted more attention to the analysis of these complications than have those of other countries, divide the septic complications into mucosal and bony. The first group includes all inflammations of the gum and surrounding mucous membrane, with possible extensions to the tonsil, throat, and lymph or salivary glands. These may be trivial, serious, or fatal. The bony group includes cyst formation, periostitis, and osteomyelitis; these cases are much less common than the mucosal group, but a far greater proportion of them constitute severe or dangerous illnesses.

The accompanying Chart shows the figures for the more important conditions noted in the contributed series and the literature series respectively. They form a very comparable set of figures, with a few notable discrepancies. There appear to be far more cases of external swelling in the literature than in my contributed cases. I think it very probable that many of my correspondents regarded this as such an obvious symptom that it was not worth mentioning, whereas those who published their cases naturally noted it down. The main discrepancy, however, lies in the groups labelled accidents, fractures, and acute suppuration. The first two are higher in my series than in the literature series. My contributors have generously sent me records, which quite naturally they might not care to publish, of accidents in the course of extraction, and of these, fractures of the bone form a fair proportion. On the other hand, they have probably not considered a minor degree of inflammation of the gum worth troubling to send me, whereas quite a number of authors, especially in the earlier days, published such cases—sometimes 10 or 20 in one paper—thus bringing the number up considerably in the literature series.

The reason why the lower teeth figure so much more largely in the records than the upper ones is the peculiar risk of partial eruption. An upper wisdom is generally either impacted or erupted, but a lower wisdom is all too likely to erupt normally from the

* A Hunterian lecture (abridged) delivered at the Royal College of Surgeons of England on Feb. 1st, 1935.

bone in a natural position and to be left with its posterior cusps covered by the reflection of mucous membrane from the gum to the ascending ramus. The mucous membrane thus forms a hood over a portion of the erupted tooth—a hood which the French writers describe as the "capuchon"—beneath which infection can track quite easily along the biting surface of the tooth. Once bacteria find their way under the hood they are in an ideal position for development, and sooner or later a focus of infection inevitably follows. Local discomfort is caused, but the whole condition may subside in a few days either because the general resistance of the patient is adequate or because drainage occurs and the focus is destroyed. The little inflammation recurs, however, until the tooth is fully erupted, or until some more serious development of the sepsis sends the patient to a dentist. The developments of this complication of the mucosal hood include most severe phlegmonous and anginal infections of the mouth and throat, spreading sometimes to the mediastinum, neck, or cranial cavity, and resulting not infrequently in dangerous illness or death.

CHART OF COMPLICATIONS ATTENDING ERUPTION OF WISDOM TEETH

A total of 622 cases are analysed, 311 from private reports (white columns), 311 collected from the literature (black columns).

Contributed.—Male 150, female 144 (17 unstated). Ages 14–84. Skiagrams taken in 199.

Literature.—Male 143, female 141 (27 unstated). Ages 14–84. Skiagrams taken in 167.

The figures in parentheses give the number of cases in which the symptom was cardinal.

Mental and nervous cases are further classified into—

	Contributed.	Literature.
Nervous breakdown	17 (17)	15 (8)
Depression	7 (4)	8 (4)
Mental	16 (3)	12 (6)

Osteomyelitis, &c., is further classified into—

	Contributed.	Literature.
Osteomyelitis	16	25 (13)
Cellulitis	10	19
Ludwig's angina	7	12
Cavernous sinus thrombosis ..	2	6 (1)
Spheno-max. abscess	1	—
Œdema glottidis	1	5

Case Records

The best way of illustrating the figures set out in the Chart is to quote a few cases. The difficulty is to make a selection amid such a wealth of material.

Extraction through a septic area.—A man of 36 [1] had an acute inflammation of the gum round his wisdom tooth, and was advised not to have it extracted at the time. He insisted on extraction, developed osteomyelitis, and was ill for 12 weeks, with an extremely swollen face, trismus, and sinuses opening both on to the cheek and into the mouth. The resulting sequestrum involved nearly half the thickness of his jaw and he was not well until five months after the extraction.

A young man of 20 [2] had a typical Ludwig's angina after a difficult extraction of a lower molar. He died from severe toxæmia, the whole floor of his mouth having rotted out with extensive necrosing cellulitis.

A man of 55 [3] had an upper right molar removed at his own urgent request. His pain increased, and swelling extended to the right temple and ear. He died of profound sepsis following cavernous sinus thrombosis, cellulitis of the face, pharynx, and mouth, and multiple embolic abscesses of the lung.

Severe bony infection.—Moczar [3] records 16 deaths as the result of infection starting round a wisdom tooth, going on to periostitis, and proceeding to such complications as thrombosis of the cavernous sinus, basal meningitis, suppurating pneumonia, œdema of the glottis, purulent mediastinitis, abscess or gangrene of the lung, and cellulitis of the neck.

A girl of 18 came to Moulonguet [4] in a really terrible condition, having been suddenly seized with dysphagia and trismus when apparently in perfect health. She was gravely ill with fœtid ulceration of the right tonsil and base of the tongue, which had arisen around a lower wisdom tooth which the author dared not extract while she was in that condition. After a month's energetic treatment she recovered at the expense of a sequestrum which involved all the teeth from the first pre-molar backwards.

Severe soft tissue inflammations.—A man of 27 [5] had an enormous diffuse swelling of the soft palate, tonsils, and pillars of the fauces, with intense trismus, embarrassed respiration, abundant and fœtid salivation, rapid pulse, and fever. The source of his trouble was an inflamed mucosal hood over a right lower wisdom, the front half of which was carious. The trouble had come on in less than 24 hours; swallowing was impossible; the whole back of the mouth was disorganised and half a glassful of fœtid pus was removed from the soft palate. The man was ill for a month, but all his symptoms disappeared completely when the tooth was extracted.

Some terrible consequences have followed failure on the part of doctors and dentists to recognise the existence of these complicated eruptions.

One of the most tragic was that of a girl of 18 [6] whose recurrent swelling due to a deformed and impacted wisdom

tooth was diagnosed as periosteal sarcoma. The tumour was excised, but as the swelling recurred she was treated by radium, which left her with ulceration of the mouth and a discharging sinus. She was threatened with another grave and disfiguring operation, and only then did her relatives demand radiological examination, which showed the cause. Unhappily the radium ulceration took nearly a year to heal.

A young lady [7] had suffered for ten years from severe headaches and occasional vomiting, and the cause was diagnosed as tumour of the brain. Fortunately the radiologist who investigated her skull drew attention to a fully developed tooth impacted just below the coronoid process of the mandible. The headache disappeared the day after its extraction and did not recur.

A doctor [8] suffered intractable pain in the lower jaw and tried many forms of treatment in vain, until Dechaume discovered a left lower wisdom lying horizontally and eroding the pulp of the second molar.

A female patient [6] had 20 years' neuralgia on the left side of her face, and her life was completely ruined. She had to stay in bed in an over-heated room with her face wrapped in a shawl, and every kind of treatment had been tried in vain. Only when she developed fever and trismus was a radiogram taken which revealed a horizontal wisdom tooth at the base of the coronoid process. She recovered completely when this was extracted.

A man of 36,[9] who had rigidity and spasms of the muscles of the face and leg, was diagnosed and treated as tetanus but was completely cured when a dentist was called in and extracted a left upper wisdom.

A young man of 23,[10] who had excellent teeth, had suffered for two years from epilepsy and had been discharged from hospital as hopeless. His fits ceased when a badly impacted lower left wisdom, eroding the second molar, was removed.

A typist of 35 [11] suffered from sleeplessness, nervousness, and a pronounced iritis. Her teeth were radiographed and the films were presented to three successive oculists, all of whom excluded them, treated her in vain, and gave her a very bad prognosis, so that she became extremely depressed and even suicidal. When a perfectly healthy but impacted wisdom tooth was removed from her left lower jaw she showed improvement in three days, and was back to work again in four months, remaining well up to two years.

Mental and nervous complications.—Cotton and Upson in America, and Graves in this country, have drawn attention to the association between dental complications and the psychoses. Cotton observes that the only sign of impacted wisdom teeth may be a rapid pulse in an otherwise healthy individual.

He describes [12] a girl of 17 who became violent, destructive, excited, and hallucinated, and received every treatment without benefit. She slept well and talked sensibly for the first time directly after the extraction of impacted wisdoms, and subsequently recovered. A girl of 17 who was devoted to her father lost all family affection and became maniacal. A boy of 16 became nervous and sleepless, lost family affection, and took to thieving. Both these young people recovered their normal mental state on extraction of impacted wisdom teeth.

A lady about menopausal age [13] developed most severe asthma which threatened her life. Every conceivable kind of treatment was tried, and eventually some benefit was obtained from the administration of ovarian and mammary extracts, and a record of the case was published at this stage.† She had a severe recurrence, however, and was thought to be dying until an impacted left lower wisdom was discovered so high in the ramus that it did not show in dental films. She recovered from the moment of its extraction, and has remained well for 11 years. We might fittingly apply to this case the words: "On assista à une véritable résurrection," which Lardennois and Leclercq [14] used in describing the effect of extracting a malposed left lower wisdom from a woman of 25. Six weeks after a normal confinement this patient began to suffer from sudden feverish attacks; during the third of these she felt a sharp pain in the right wrist, and was found to be suffering from osteomyelitis of the lower end of the radius. She remained ill in spite of many kinds of treatment; her condition became alarming, and her pallor and arrhythmia made physicians suspect endocarditis. A septic focus was sought, and after a long time was traced to the inflamed and suppurating mucosal hood over this tooth. She was fit again ten days after the extraction and remained well during three years' observation.

† I am indebted to Mr. H. Stobie for the later details of this case.

THE CAUSE AND THE CURE

For Capdepont [15] and Fargin-Fayolle [16] there is one complication and one only of erupting wisdom teeth: infection. They declare that in the absence of a pericoronitis there is no complication. While it is true that infection plays a large part, I have records of a number of cases where the tooth appeared perfectly healthy and yet grave symptoms resulted from its existence unerupted in the jaw.

The cause of these complications must be taken back a stage further than the question of whether or not infection plays a part. The problem is why the wisdom tooth should fail to erupt perfectly in any case. It is clear that the answer to this must lie either in a disharmony between the alveolus and the jaw, or in some defect of the tooth germ. While in a few cases there may be a distortion of the germ, with the result that the tooth lies horizontally or upside down, or is grossly misplaced towards the lower border of the mandible or the upper border of the maxilla or the sigmoid notch, I regard the common maleruption and mesio-oblique type of impaction as the expression of a developmental arrest. The wisdom tooth develops primarily with its occlusal surface facing lingually and anteriorly. At a certain stage of development it should rotate so as to face directly upwards, at the same time emerging from under the root of the ascending ramus. It is developmental arrest at this stage which produces impaction and maleruption. I have traced this process in skiagrams of growth series of both sexes of the gorilla, chimpanzee, macacus rhesus, domestic pig, and lechwi, as well as in ancient Egyptians, aboriginal Australians, and nineteenth century Hindus.

I am continuing my investigations with the object of finding out the fundamental reason why development of the wisdom tooth becomes arrested, and to ascertain what part, if any, is played by climatic, nutritional, genetic, and other factors. My own belief is that the great majority of wisdom tooth complications might be averted by a systematic investigation of the jaw of the school-child and adolescent, in order to ascertain whether or not the developing wisdom teeth are in correct position, with a reasonable prospect of normal eruption. The age at which abnormality of the wisdom can be recognised is between 9 and 11. An aberrant wisdom in a child of this age should be watched by the dentist with the help of X rays; if the position is bad he should extract the whole tooth follicle at the critical moment when the cusps begin to develop and before the crown is large. At this stage extraction is an easy matter. Nevertheless, the operation requires a certain degree of technical skill and practice, and the dentist who does not consider himself capable of performing it should be content to remove an anterior tooth in order to make room for the wisdom tooth to rotate and erupt into its correct position. Intervention at this stage would save most, if not a- of the dreadful complications which I have described

The one unforgivable sin is to let matters drift into one of the lurid pictures with which the literature abounds.

REFERENCES

1. Marston, A. T.: Proc. Roy. Soc. Med., 1927–28, xxi., 1622.
2. Kuhn, H. P., Helwig, F. C., and Webb, G. F.: Jour. Amer. Dent. Assoc., 1933, xx., 2155.
3. Moczar, W.: Zeits. f. Stom., 1932, xxx., 651.
4. Moulonguet: Arch. Int. Lar., 1927, vi., 619.
5. Miltner, L. J., and Wolfe, J. J.: Surg., Gyn., and Obst., 1934, lix., 226.
6. Pollosson, E., and Dechaume, M.: Presse méd., 1928, xxxvi., 449.
7. Buckley, T. A.: Jour. Amer. Dent. Assoc., 1932, xix., 2016.
8. Dechaume.: Revue de Stom., 1930, xxxii., 229.
9. Rouveix, J.: Ibid., 1924, xxvi., 290.
10. Earle, D. W.: N.Z. Dent. Jour., 1933, xxviii., 132.
11. Roller, O. P.: Dent. Cosm., 1922, lxiv., 506.
12. Hunter, W.: Amer. Dent. Surg., 1928, xlviii., 31.
13. Ross, J. N. MacB.: Brit. Med. Jour., 1922, i., 390.
14. Lardennois, G., and Leclercq, A.: Revue de Stom., 1930, xxxii., 278.
15. Capdepont, C.: Rev. de chir., 1910, xli., 1052.
16. Fargin-Fayolle, P.: Presse méd., 1910, xviii., 869.

THE DEAF-MUTE

A PLEA FOR EARLY TREATMENT

By Philip Franklin, F.R.C.S. Eng.

OTOLOGIST TO THE RESEARCH CLINIC FOR DEAF-MUTES, AND INFANTS HOSPITAL, VINCENT-SQUARE.

A great many deaf-mutes have, or have had, some degree of residual hearing, but of these only a very few have had the early training and education needed to exploit this residuum. The potentialities of the young deaf-mute, both as regards speech and education, are considerable, and when use is made of them by means of deaf aids and other methods of opening the avenues of approach to the child's mind, the energy, enthusiasm, and thirst for knowledge shown is often very striking. A recent article [1] by Dr. P. H. Tookey Kerridge has well shown the place of physics in the problem of the deaf child. Basing her conclusions on the examination of the hearing curves of children at one London school she has estimated that as many as 84 per cent. of them should be able, by the use of one or other of the deaf-aids now available, to appreciate amplified speech. At a special clinic for deaf-mutes, which was started at the Infants Hospital, Vincent-square, rather more than a year ago, an organised effort is being made to coördinate modern knowledge of the physical properties of sound, and of the instruments concerned in transmitting and amplifying it for the benefit of the deaf child. It was Helmholz who first combined the knowledge of physics and physiology in this field; and Alexander Bell who in 1874 in coöperation with a famous Boston otologist devised a method of exhibiting sound vibrations optically. The analysis of sound by D. C. Miller,[2] however, represents the beginning of modern research on speech, and psychologists such as H. Watt [3] have devoted themselves to sound perception. Laboratories are now producing electrical equipment to enable recent discoveries to be put in practice. The Bell Telephone Laboratories and the Western Electrical Co., with whom the names of Harvey Fletcher and Irving Grandall are associated, have elaborated means for the production, transmission, and amplification of sound and have designed the two main instruments used in this clinic—the audio-frequency-amplifier and the teletactor.

[1] The Lancet, Jan. 12th, 1935, p. 104.
[2] The Science of Musical Sounds, New York, 1916.
[3] The Psychology of Sound, Cambridge, 1917.

THE AUDIO-AMPLIFIER

The audio-amplifier, more accurately described as the audio-frequency-amplifier, was evolved for the clinic in the laboratories of Western Electric Company in London. It is designed to produce sound from gramophone records representing noise, speech, and music. A revolving turn-table holds the records. Sound volume is controlled by the means of valve amplifiers up to a loudness level of 130 decibels, the unit of power ratio. The level of loudness produced is indicated by a potentiometer, which is calibrated in decibels. Sound is transmitted to the listeners' ears by receivers similar to the ordinary telephone receiver. The apparatus has been designed to amplify sound to the extreme limit of distinct perception. A microphone can also be attached to the amplifier so that either voice or records can be used as the source of sound. A further use of this instrument is its employment as groundwork for the later use of the teletactor.

Gramophone records for use with the audio-amplifier have been evolved with the assistance of the technical staff of H.M.V. There are three records. The first record produces noises such as whistles, bells, a barking dog, to which the normal hearing child is accustomed. The second record was made to introduce certain letters of the alphabet, vowels and consonants, reiterated and delivered in a special manner. Consonants are used as the medium for carrying vowel sounds to the partly functioning basilar membrane in the inner ear—e.g., Lul, Lul, La, La, Mum, Mum, Ma, Ma—instead of the individual consonant sounds. The third record represents a bass singer doing the scale (doh, ray, me, &c.). These records were made in accordance with the chart of Wegel and Lane [4] showing the regions on the basilar membrane that react to varying frequencies, and the fact that residual hearing is low-frequency hearing. It is intended to evolve educational records containing simple sentences, verses, and music for later training.

THE TELETACTOR

The object of this instrument is to transmit amplified sounds which are received by the subject through the finger-tips being placed on a metallic vibrating plate. This instrument was designed by the Bell Telephone Company, of New York, at the suggestion of Prof. R. H. Gault, of the Northwestern University in Illinois who has published several papers on his experiences with it during the last eight years in connexion with deaf-mutes and the deaf-blind in America. The instrument used at Vincent-square, the only one in Europe, consists of a microphone, valve amplifier, and receiver, the last being a vibrating metal plate on which the child places its finger. Its use can best be described in Prof. Gault's words:—

"The teletactor is patterned after the telephone in that it requires a microphone (transmitter) into which the teacher or the pupil speaks and a receiving diaphragm that vibrates in unison with the action of the voice. If the skin were as sensitive as the human ear, it would be a simple task to train the deaf child to speak and also receive oral communications from his fellows, for against his fingers would be all of the vibrational elements out of which the ear constructs spoken language. Unfortunately for the deaf child, the sensory cells in the skin are not as well adapted to receiving vibrational stimuli as are the more delicately constructed organs of Corti in the inner ear. The young deaf child who encounters the teletactor for the first time will not receive from it enough cues to enable him to develop into a normally speaking child without first having had the usual visual instruction in the placement of his lips, tongue, and palate, as well as the proper utilising of his nasal cavities and chest. The teletactor will, however, stimulate the child's interest in oral speech, and herein lies one of its great virtues, for speaking is always more or less distasteful and laborious for the deaf child. No more desirable approach to the speech work could be wished for than this pleasurable conditioning, for the deaf child who rejoices in speech work will progress much more rapidly than the one to whom it is an onerous task."

Gault found that the advantages afforded by the

combined stimulations (that is, by lip-reading and the teletactor) over visual stimulation alone was 30 per cent. The teletactor is thus merely a method of supplementing the ordinary avenues of approach in training the child to appreciate sound in terms of vibration which is, after all, a method relying upon the primitive vibration sense—the tactile. The differences between the sensitivity of the ear and the sensitivity of touch have been computed for eight different frequency levels. At a frequency 64dv, the ear is approximately 100 times as sensitive as the finger-tip, but at a frequency of 2000, the ear is over 500,000 times as sensitive. With increasing frequency the ear becomes more sensitive and the touch less sensitive. Thus for the higher frequencies, increasing amplification is necessary so that the deaf will feel the higher tones of speech and music in the same relative intensity as the hearing person perceives them through the ear. This instrument provides the necessary amplification, which accounts for the effectiveness with which speech and music are interpreted when communicated by the teletactor to the finger-tips.

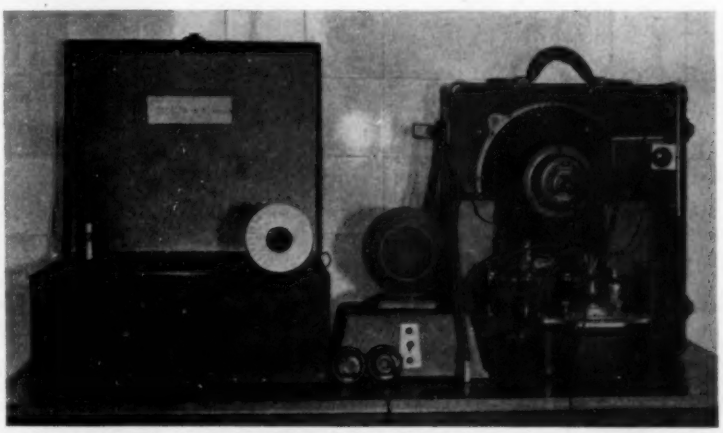

FIG. 1.—The Audito-frequency-amplifier. Revolving gramophone plane and potentiometer on the left; microphone on the right.

METHOD OF TREATMENT

Early stimulation by these instruments affords several possibilities. It may prevent further loss of hearing from disuse, it may increase the residual hearing, and most important, it may facilitate later education. The child makes acquaintance with sound, of which he has never before been conscious, so that he can recognise and respond to it. The ability of a deaf child to "babble" already indicates the presence of some hearing power. Where there is any auditory perception left, treatment is by triple stimulation of the visual, the tactile, and the auditory senses. In practice this means that the child sees the speech therapist form the words, "feels the words" with its finger, and hears them by means of an amplified sound apparatus. Where there is no auditory perception left, and the deafness is total, only dual stimulation is possible, that is, visual and tactile. One of the problems of education is to interpret vibrations—noise, speech, or music—in the order of their periodicity or rhythm. Music is more rhythmic and periodic than speech, and the latter more so than noise. The child's ability to differentiate any details will naturally depend on the functional capacity of the organ of Corti. The basilar membrane vibrates to basal tones and overtones which depend on the periodicity of the sound stimulus. If residual hearing alone is present the low tones may obtain a cochlear reaction, but only in that part of the basilar membrane affected by low frequency or pitch.

In the clinic at the Infants Hospital, coördination is aimed at between the physicist, who is concerned with a sound-amplifying apparatus and the teletactor; the otologist who is concerned with diagnosis and determination of degree of residual hearing present; and the speech therapist whose special knowledge enables her to educate the as yet unstimulated power of speech. All three work as a team, and it should be borne in mind that the cases they treat are those for whom medical or surgical treatment in the accepted sense is useless. The cases dealt with, therefore, come within the field of guidance and training—education in the strict sense. The unit is, in fact, rather educational than medical.

FIG. 2.—A first lesson with the Teletactor. The child on the right is receiving vibration stimuli on ear and fingertips.

When deafness is suspected an effort is made to assess its degree. By means of the instruments already mentioned stimulation of the natural auditory channel can with advantage be started as early as two years of age. This should be supplemented by the institution of voice training under the guidance of a speech therapist. The teletactor transmits sound vibrations to the patient's finger-tips, completes the therapeutic unit, which aims at the coördination of the three major senses, sight, hearing, and touch. The object is to combat mutism and to create speech with a natural

voice. Substitution of the tactile for the deficient auditory sense assists in creating a method of communication with a more natural and understandable voice than that achieved by use of single stimulation—visual or lip-reading alone. In the partially deaf stimulation is possible of the three major senses—visual, tactile, and auditory—the latter by the use in the clinic of the audio-amplifier.

FIG. 3.—Showing use of the Teletactor as a means of communication between deaf-mutes. The child of 3 (on the left) is speaking into the microphone to the child of 2 (on the right) who receives the sound impulses by the finger-tip resting on the vibrating plate. Note the coöperation of the parents.

Facts about the history of each case are collected, the mother's evidence being of particular importance. She can give useful information concerning any prenatal, natal, and postnatal irregularity. Her testimony as to whether the child ever formulated words babbled or maintained complete silence is of value in classifying the case as congenital or acquired deafness, with total or partial hearing loss. Complete mutism, for instance, indicates total hearing loss. Functional tests are of small value in extreme deafness represented by deaf mutes. The vestibular turning test, however, is relatively simple, because the child is inclined to view this manœuvre as a form of play. There may be considerable difficulty in diagnosing deaf mutism when it is simulated by delayed development, word deafness, and congenital aphasia. Cases complicated by mental deficiency are eliminated as soon as they are recognised. It may require several examinations before clinic training is finally decided.

Having obtained a guide as to the degree of residual hearing present, treatment is begun. The average session for each child is about 15 minutes though every case presents its own problem. The primary treatment is auditory stimulation with noise, speech, and music. The essential motive is to cultivate attention as the basis for subsequent perception. Even normal children require training to establish attention, and many children are liable to be refractory. Considerable patience may be required, and the child may have to be played with and coaxed for a long while before it will submit to the alarming instruments with which it is surrounded. Some behave better if they are allowed to watch one another under treatment. Once disciplined all enjoy the methods of the clinic and show an increasing interest. Treatment must never be continued when its interest has gone and the child becomes restless.

The present attendance at the clinic numbers 30 cases whose ages vary between 18 months and 5 years. Thirteen have attended for over 6 months, the remainder for less. Of the former 8 are boys and 5 girls. Classification of deafness is as follows: totally deaf, 6; partially deaf, 7; congenital, 7; acquired, 6. All are presumed to possess residual hearing until the contrary is proved, the principle being that it is safer to stimulate the natural auditory channel in the absence of hearing than to neglect its stimulation if present but unsuspected. Valuable time is lost by the practice of delaying treatment until the age of 7 years has been reached. Educational therapy begun as early as the second year of life will hasten the mental development of the child, encourage the acquisition of natural voice production, and may increase the residual hearing. Certain points have impressed themselves on me so far: (1) the astonishing ease with which the deaf child's interest and attention is secured; (2) the spontaneity with which the deaf-mute reacts to a minimum of treatment by emitting sound "babbling"; and (3) the improvement in the attitude of the family towards the deaf-mute child, substituting a natural and encouraging environment for an unnatural and depressing one.

DIABETES MELLITUS AND THE PITUITARY GLAND

A CASE OF DIABETES WITH INTERCURRENT PITUITARY LESION AND CONCOMITANT IMPROVEMENT OF DIABETES

BY ALEXANDER LYALL, M.D. Aberd., M.R.C.P. Lond.
LECTURER IN CLINICAL CHEMISTRY IN THE UNIVERSITY OF ABERDEEN; AND

J. ALEXANDER INNES, B.Sc., M.B. Aberd., M.R.C.P. Lond.
ASSISTANT PHYSICIAN TO THE ABERDEEN ROYAL INFIRMARY

VERY little direct clinical evidence seems to exist concerning the effect of pituitary activity on carbohydrate metabolism in general and on the disturbed sugar metabolism of diabetes mellitus in particular. Though much experimental evidence has been accumulating, and this has cleared some of the problems of the relationship, it has not been readily applicable in clinical practice. This state of affairs is not surprising since experiments on animals produce lesions which are acute and severe compared with the chronic pathological process in disease of the pancreas or pituitary in man. It is of interest to compare the evidence derived from clinical observations with that acquired by animal experiment. The former is found to be meagre and indeterminate, while the latter is voluminous but often conflicting.

In clinical hyperpituitarism with signs of acromegaly it is usual to find decreased sugar tolerance, hyperglycæmia, and glycosuria at some stage of the disease. The hyperglycæmia is more resistant to the action of insulin than that of pancreatic diabetes. The sugar tolerance may improve during the course of the disease—an unusual occurrence in well-developed pancreatic diabetes in man. In hypopituitarism of the Froehlich type there is usually an increased ability to deal with sugars or their precursors, a flat blood-sugar curve in response to glucose ingestion and a decreased metabolic rate with consequent obesity. But whether these metabolic disturbances are due primarily to any altered secretion of either the anterior lobe or the posterior lobe of the pituitary, or whether they are due to secondary stimulation or depression of pancreatic, thyroid, suprarenal, or

ovarian function, does not seem clear from any clinical evidence available. It is usually accepted that alteration in function of the anterior lobe of the pituitary is responsible for the general clinical manifestations of acromegaly and hypopituitarism. It is natural to assume that disturbances in carbohydrate metabolism in these diseases are also due to dysfunction of the anterior lobe. If this is not so, depressed secretion of the posterior lobe of the gland must also be postulated in hypopituitarism, while irritation and increased secretion of the posterior lobe must be assumed in acromegaly. On broad principles it would appear from the consideration of clinical material that the pituitary secretion possesses a capacity for antagonising the action of insulin. No more definite statement can be made. Colwell,[1] who made a full review of the literature on the relation of the hypophysis to diabetes mellitus, concluded that the rôle of the hypophysis in carbohydrate metabolism was not definable with certainty. He thought it probable that the pituitary was without significance in this field as a gland of internal secretion, but that important nerve centres and pathways in or near it were concerned in the control of the metabolism of carbohydrates.

The relative information acquired from animal experiment concerns the effect of removal of the pituitary on carbohydrate metabolism, the effect of removal of the pituitary on other endocrine glands, especially the thyroid and adrenals, the effect of pancreatectomy on animals without a pituitary gland, and the result of pituitary transplants or injections of pituitary extracts in healthy animals or in those which have had either the pituitary or the pancreas or both removed.

It is well established from the numerous publications of Houssay and his co-workers [2] and from the work of Mahoney [3] and others that animals from which the pituitary has been removed are liable to attacks of hypoglycæmia which are either spontaneous or can be produced by starvation or adrenaline injection.[4] These attacks are due to overactivity of endogenous insulin or to diminished thyroid and adrenal secretion. After destruction of the pituitary, animals become extremely sensitive to the hypoglycæmic effect of injected insulin as shown by Corkill and Marks.[5] There is a definite depression of nitrogen metabolism and a decreased level of nitrogen equilibrium as demonstrated by Braier.[6] Hypophysectomy causes a reduction in the weight of the adrenals,[7] and reduction in the basal metabolism after hypophysectomy is due to secondary diminution of thyroid activity.[8]

Pancreatectomy in dogs where the pituitary has been previously removed is followed by only mild diabetic symptoms. There is less severe hyperglycæmia and glycosuria, less rapid katabolism of endogenous protein, and less severe wasting.[2 9 10]

Injection of posterior lobe extract can counteract the effects of insulin as shown by Burn [11] in normal rabbits, by Houssay and Di Benedetto [12] in normal dogs, by Geiling and Campbell [13] in dogs from which the pituitary has been removed, and by Schroeder [14] in man. Houssay [15 16] however has more recently demonstrated that extracts of the anterior lobe of the hypophysis injected into normal dogs produce hyperglycæmia, glycosuria, and ketonuria, and also that when anterior lobe extracts are injected into depancreatised dogs, increased severity of the diabetic symptoms is produced. Supporting evidence that the anterior lobe of the gland is closely concerned with changes in carbohydrate metabolism is afforded by the work of Eitel and Loeser,[17] who showed that repeated injections of the anterior lobe have a direct influence in stimulating thyroid secretion and a secondary influence on carbohydrate metabolism with depletion of glycogen stores in the liver and increase in blood-sugar.

There seems to be no doubt that pituitary lesions and probably most definitely those of the anterior lobe exert a marked influence on carbohydrate metabolism. The manifestations may be slow and rather indefinite in the presence of a healthy pancreas but are more dramatic when true pancreatic diabetes already exists. It would be extremely important to observe the effect of pituitary lesions, whether natural or produced, in well-established diabetes in man. We believe that the following case illustrates this sequence, and shows the result of a complicating pituitary lesion in a well-established case of true pancreatic diabetes.

CASE-HISTORY

The patient, a trawl fireman aged 27, was admitted to Dr. Croll's ward, Aberdeen Royal Infirmary, on April 8th, 1933, complaining of thirst, frequency of micturition, loss of weight, and an increasing appetite. There was also a small abscess of the forearm.

The first symptoms, thirst and polyuria, were noticed four months previously. His personal and family history presented no important features, and venereal disease

FIG. 1.—Radiogram showing abnormal condition of the sella turcica.

was denied. He smoked about twelve cigarettes a day and was a total abstainer.

Upon examination his weight was 97 lb. and height 5 ft. 2 in. He appeared a poorly nourished, nervous, and restless individual, with wasting and muscular weakness. He had a slight cough with some mucopurulent sputum. Some degree of pulmonary fibrosis was present, but no evidence of active disease was made out, and the sputum was negative for the tubercle bacillus on several examinations. The cranial sinuses were not infected. There was no gross abnormality of the cardiovascular system, and the blood pressure was 122/88. The Wassermann reaction in the blood was negative. Examination of the abdomen revealed no abnormality, and the alimentary system appeared healthy. There was no constipation.

Apart from some hypoæsthesia of the hands and feet, examination of the central nervous system was negative. Hypermetropic astigmatism was present but no retinal changes. The cerebro-spinal fluid showed a negative Wassermann reaction, contained no excess of protein or cells, and was not under pressure. The urine contained a large amount of sugar and acetone but no albumin, and measured up to 136 oz. daily with a specific gravity up to 1044. A sugar-tolerance test on April 11th, 1933, gave the following results: fasting blood-sugar, 0·306 per cent.; ½ hour, 0·462 per cent.; 1 hour, 0·472 per cent.; 1½ hours, 0·482 per cent.; 2 hours, 0·492 per cent.

The diagnosis at this period was one of severe pancreatic diabetes, and the patient was treated with insulin.

He left hospital at the end of a month (May 6th) on a diet of 2160 calories (C. 120 g.; P. 90 g.; F. 146 g.) and 40 units of insulin twice daily. The fasting blood-sugar was now 0·109 per cent. and the urine was normal in quantity, but showed a slight trace of sugar. The patient had gained 7 lb. in weight. After discharge he attended the out-patient diabetic clinic for the next seven months, and apart from some hypoglycæmic attacks, in one of which the blood-sugar was 0·072 per cent., and which necessitated the reduction of his insulin to 24 units twice daily, he looked and felt well and his weight increased by 28 lb. As some of his hypoglycæmic attacks appeared to be epileptiform in character, he was readmitted to hospital on Jan. 27th, 1934, for further investigation.

His fasting blood-sugar was now 0·113 per cent., and the blood-sugar 90 minutes after 15 units of insulin and food was 0·090 per cent., and the same reading was got two days later under similar conditions. His insulin dosage was therefore reduced gradually over a period of three weeks to nil, when the patient was discharged from hospital on a diet of 2174 calories (C. 106 g.; P. 88 g.; F. 170 g.) without insulin and with no glycosuria. On this régime his urine remained sugar-free for six months and his weight kept constant.

In August, 1934, he complained of upper abdominal pain, suggestive of a duodenal lesion. His fractional

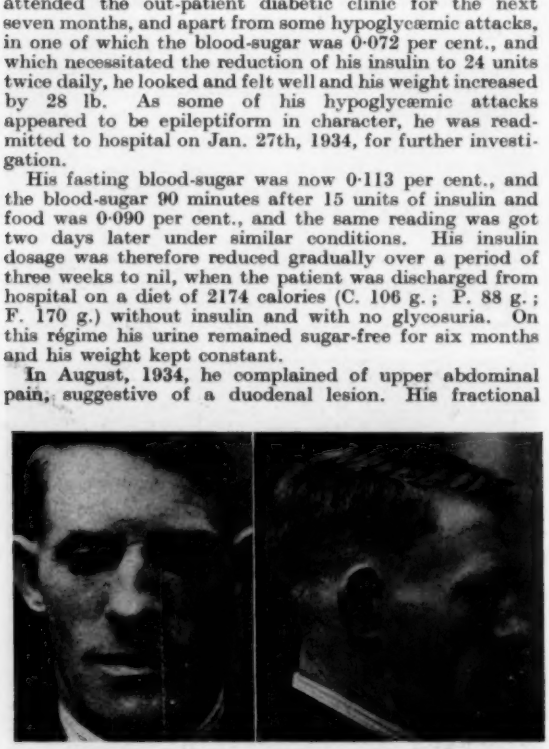

FIG. 2.—Photographs of the patient in October, 1934.

test-meal showed mild hyperacidity (up to 70) but no blood. The stools were persistently negative to the benzidine test. Barium meal examination showed no abnormality of the stomach and no evidence of duodenal ulcer. There was a delay in emptying of the second part of the duodenum, suggesting the presence of a duodenal pouch or constriction. Clinical findings and examination of the stools were negative for any evidence of a gross pancreatic lesion. There was no latent jaundice.

A sugar-tolerance test done on Sept. 21st, 1934, was as follows: fasting blood-sugar, 0·113 per cent.; ½ hour, 0·243 per cent.; 1 hour, 0·252 per cent.; 1½ hours, 0·206 per cent.; 2 hours, 0·197 per cent. This curve shows that the diabetic condition was definitely much less severe than at the first examination, and it was thought possible that the improvement might be due to an adenoma of the pancreas involving proliferation of islet tissue which accounted for increased insulin production by the patient himself. This hypothesis, however, could not be supported on the evidence, and it was considered advisable to re-examine the patient in routine fashion. In the course of this examination a lateral skiagram of the skull now showed definite evidence of a pituitary tumour—an abnormally dense deposit lying in the sella—and a lateral stereo confirmed the position of the radio-opaque mass (see Fig. 1). Ten months previously the radiological report on this region was: "Sella somewhat small with approximation of clinoid processes."

A full ophthalmological examination was repeated (Oct. 29th) and showed that the fields of vision for white and red were full, and there was no evidence of pressure on the chiasma. Anthropometric measurements of the patient were made by Prof. A. Low of the Anatomy Department of Aberdeen University, and these did not suggest any tendency to acromegaly. There is no change in libido in the patient. He is now well, maintaining his weight on a diet of 2174 calories (C. 106; P. 88; F. 170) with no glycosuria and a fasting blood-sugar of 0·113 per cent.

DISCUSSION OF CASE

The important point in this case is to establish a reason for the remarkable improvement in the severity of the diabetes with cessation of the need for insulin. Cases of severe diabetes usually require insulin permanently, and there are few cases on record where it has been possible to dispense with insulin entirely. There are, however, a number of reasons which may render modification of insulin dosage necessary.

1. Cases of diabetes with severe sepsis at the onset of treatment may require less insulin later, since a septic focus produces an antagonism to the action of insulin.

2. Patients may require less insulin after leaving hospital when they resume a more active life. Increased muscular activity results in a more rapid oxidation of available glucose.

3. Cases of dysinsulinism are described by Joslin, John, and others where periods of loss of carbohydrate tolerance with hyperglycæmia are followed by periods of renewed tolerance for sugar with a normal blood-sugar value. The explanation of these cases is still doubtful.

4. In cases of diabetes with hyperthyroidism, insulin dosage may be reduced after removal of part of the thyroid gland.

5. During pregnancy in the diabetic, insulin requirements may be decreased owing to the absorption of fœtal insulin through the placenta into the maternal circulation.

In the present case sepsis and the resumption of a more active life are the only factors which might apply. The sepsis amounted only to an infected blister, and there was no reduction of insulin dosage long after permanent healing of the lesion. The first signs of renewal of sugar tolerance occurred two months after discharge from hospital. Thus neither of these factors offers a solution. Two possibilities remain, either a renewed secretion of endogenous insulin or a favourable influence on insulin activity which can be attributed to the lesion found in the pituitary body.

The presence of an insulogenic adenoma of the pancreas seemed at first a possibility. There is little to support this contention. There is no palpable tumour and no evidence pointing to a lesion of the pancreas. The only suggestive finding is the presence of stricture and dilatation of the second part of the duodenum. We have no means of knowing how long this has existed.

The nature of the lesion in the pituitary is still in doubt. It may be classified as a cystic adenoma which is becoming calcified. It may be a meningioma arising from the dorsum sellæ. It has shown comparatively rapid change during the period of nine months, more in the degree of calcification than of enlargement. There are still no signs of pressure on neighbouring structures.

We are strongly of the opinion that this lesion is the basis of the improvement in carbohydrate tolerance in this case. We are convinced that the diabetes was of true pancreatic origin at the onset of symptoms, when presumably the pituitary secretion was normal in amount and in kind. As the pituitary lesion progressed, diminished amounts of pituitary hormones entered the blood stream and in the

absence of pituitary antagonism to insulin the patient became hypersensitive to injected insulin. Endogenous insulin became sufficient to maintain the blood-sugar within, or nearly within, normal limits. If this hypothesis is correct, the patient provides an analogy to the experimental animal which does not show the symptoms of diabetes upon pancreatectomy if the pituitary has been previously damaged. We have proved that the patient is now very sensitive to the action of injected insulin. In response to 10 units subcutaneously the blood-sugar fell within 85 minutes from 0·133 to 0·062 per cent. with the onset of hypoglycæmic symptoms. This shows another characteristic of the animal which has had the pituitary removed—hypersensitivity to injected insulin. It is possible that the patient may progress to show spontaneous hypoglycæmia.

Another interpretation of the case-history is possible. It might be suggested that the severe diabetes at the onset was that of hyperpituitarism. This cannot be maintained since there are no clinical features of hyperpituitarism in the case (see Fig. 2). Moreover, very few cases of hyperpituitarism are on record where glycosuria has occurred early in the disease, and only one case is recorded where glycosuria was observed before the onset of acromegalic symptoms.

SUMMARY

A case of severe diabetes is described in a man, aged 29 years, where marked improvement in the diabetic condition has taken place concurrently with the development of a pituitary lesion. The patient's condition is considered to be clinically analogous to that of an experimental animal in which both pancreas and pituitary are destroyed.

REFERENCES

1. Colwell, A. R.: Medicine, 1927, vi., 1.
2. Houssay, B. A.: Klin. Woch., 1932, xi., 1529.
3. Mahoney, W.: Ann. of Surg., 1934, xcix., 387.
4. Houssay, B. A., and Di Benedetto, E.: Compt. rend Soc. de biol., 1933, cxiv., 391.
5. Corkill, A. B., Marks, H. P., and White, W. E.: Jour. of Physiol., 1933, lxxx., 193.
6. Braier, B.: Compt. rend. Soc. de biol., 1931, cviii., 128 and 508.
7. Houssay, B. A., et al.: Ibid., 1933, cxiv., 714.
8. Houssay, B. A., and Artundo, A.: Ibid., 1933, cxiv., 79 and 391.
9. Houssay, B. A., and Biasotti, A.: Rev. Soc. Argent. Biol., 1930, vi., 251.
10. Houssay, B. A., and Biasotti, A.: Pflüger's Archiv f. d. ges. Physiol., 1931, ccxxvii., 664.
11. Burn, J. H.: Jour. of Physiol., 1923, lvii., 318.
12. Houssay, B. A., and Di Benedetto, E.: Compt. rend Soc. de biol., 1933, cxiv., 793 and 795.
13. Geiling, E. M. K., and Campbell, D.: Jour. of Pharmacol., 1927, xxxi., 247.
14. Schroeder, H.: Klin. Woch., 1933, ii., 1766.
15. Houssay, B. A., and Biasotti, A.: Rev. Soc. Argent. Biol., 1931, vii., 3.
16. Houssay, B. A.: Klin. Woch., 1933, xii., 773.
17. Eitel, H., and Loeser, A.: Internat. Clin., 1934 ii., 66.

CARCINOMA OF THE STOMACH WITH MULTIPLE SECONDARY DEPOSITS IN THE COLON

By T. P. Lawrence, F.R.C.S. Eng.
ACTING PATHOLOGICAL CURATOR, HUNTERIAN MUSEUM, ROYAL COLLEGE OF SURGEONS OF ENGLAND; AND

G. H. Steele, M.S. Lond., F.R.C.S. Eng.
ASSISTANT SURGEON TO THE ROYAL SURREY COUNTY HOSPITAL, GUILDFORD

A woman, aged 49, came to hospital complaining of alternating constipation and diarrhœa for three weeks, with some griping abdominal pain and passage of blood and mucus by the rectum. She had lost 1½ st. in six months, and though there was no vomiting the appetite was poor. The doctor stated that the Wassermann reaction had been positive seven years previously, when she had a course of salvarsan.

On examination she was seen to be somewhat wasted. The abdomen was moderately distended, and an indefinite tender mass was palpable in the right iliac fossa. Rectal examination revealed a large fixed ulcerated mass. A diagnosis of subacute intestinal obstruction from carcinoma of the rectum was made, with some doubt as to the significance of the cæcal condition, which was felt to be more than distension from back-pressure. The Wassermann reaction was still positive.

The patient was admitted to hospital a week later as an emergency condition, having been vomiting for several days and being absolutely constipated for the same time.

Photograph of the specimen showing the five lesions in the large intestine, viz., in the rectum and at the sites marked 1–4 in the colon.

Laparotomy was performed, and a considerable amount of free fluid escaped. The intention was to perform a colostomy, and the sigmoid colon was found to be distended above the mass in the rectum. On further exploration, however, multiple growths were encountered along the course of the colon, one of these accounting for the mass in the cæcal region, and the bowel was seen to be in a state of obstruction above each stricture. There was another mass in the pyloric end of the stomach and the liver was normal. It was obviously impossible to do anything further, so the abdomen was closed, and the patient subsequently died.

The post-mortem examination revealed nothing beyond what was found at operation, and the description of the parts removed is as follows:—

The *stomach* shows an ulcer, the centre of which is 2 in. from the pylorus; the wall of the stomach for 1 in. on either side of this point is thickened with an infiltrating carcinoma. The growth ceases at about 1 in. from the pyloric orifice. The lymphatic glands above and below the pylorus are greatly enlarged by new growth. Microscopically the tumour is an infiltrating spheroidal-celled carcinoma.

The *large intestine* (R.C.S. Museum, No. 6535, 3) is shown in the accompanying Figure. There are five

secondary deposits of carcinoma in the large intestine. They all have the character of diffuse thickenings of the wall with constriction of the lumen. The whole length of the rectum is affected, its wall thickened to an extent of ¾ in., and the lumen is greatly stenosed especially in its upper part. The descending colon and sigmoid flexure are unaffected, except for marked dilatation. At the splenic flexure is a short stricture of moderate degree, with slight thickening of the wall. At or near the hepatic flexure is a diffuse thickening of about 2½ in. of the length of the bowel, the thickness of the wall being about ½ in.; and the lumen is reduced to about 1 in. in width. At about the middle of the ascending colon is a stricture and thickening similar to the last; and at the junction of the cæcum and ascending colon is a less-marked constriction and thickening, which at its upper part is almost continuous with the last-named constriction. The portion of bowel between the constrictions is enormously dilated and its wall thin and friable. In two situations enlarged, hard, and infiltrated mesenteric glands are present. All of the deposits have similar microscopical characters, and consist of intense infiltration of the tissues with spheroidal carcinoma cells, partly isolated and partly united into small columns. The characters are identical with those of the tumour in the stomach.

The colon and rectum measure 4 ft. in length.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF LARYNGOLOGY

A MEETING of this section took place on Feb. 1st, Mr. LIONEL COLLEDGE being in the chair, when a discussion was held on the treatment of

Chronic Infection of the Nasal Accessory Sinuses

Dr. FERRIS SMITH (Michigan, U.S.A.) said that the treatment of acute and subacute conditions of these sinuses was generally agreed but that of the chronic condition remained debatable, though most experts favoured more or less conservative measures. He would deal only with the upper group of sinuses—namely, frontal, ethmoid, sphenoid. In these chronic cases there were infected lining membranes, with chronic inflammation, cystic glandular degeneration, glandular hyperplasia, fibrosis, abscess formation, chronic periostitis, and other changes. The public could be forgiven for feeling that the efforts of the profession to deal with chronic sinus disease were for the most part failures. The recognition in recent years of the importance of chronic sinus infection in respiratory and systemic diseases had fortunately awakened a new interest in this problem. The ideal "cure" demanded the restoration of the normal condition or function, a demand too great to be satisfied in the case of a long-standing infectious process. But a clinical cure which removed the pathological condition and preserved the normal appearance of the patient could often be achieved. Non-success in treating chronic conditions of these sinuses was largely attributable to the perpetual recommendation of conservative measures and the removal of only obviously diseased parts, perhaps in one sinus only, with a desire not to disturb the lining of another sinus, the danger of which disturbance had been over-estimated. He had never failed to find bacteria in these chronically diseased sinus linings; they were common in the subepithelial areas in the early chronic cases, and were always evident about the glands and vessels, and in the reticular spaces in the cases which were of longer standing. Periosteitis and osteitis were often seen to account for the recurrent symptoms after incomplete removal of the diseased tissue. It was seldom that pure cultures were present. Hæmolytic and other streptococci were almost invariably found, and the commonest accompaniments were pneumococci and *M. catarrhalis*.

Dr. Ferris Smith considered that the time had come for the rhinologist to cast aside his conservative predilections and adopt more radical measures. No operator, however skilful, using intranasal methods could enter all the ethmoid cells, nor could he claim more than increased drainage of a frontal sinus. He would not be able, with safety, to remove the diseased linings of the superiorly placed ethmoid cells, or the diseased tissue about the cribriform plate. Failure to do this meant recurrence of symptoms in most cases, disaster in some. To deal properly with these conditions demanded a direct approach and a practically bloodless field. Herbert Tilley years ago had declared the ethmoid to be the key situation of the nasal sinuses, command of that situation being the most important factor in a successful attack on any or all of them. The direct operation on the sinus, in full view of the surgeon, produced, in skilled hands, nearly 100 per cent. of successes; it presented the minimum of risk and inconvenience, and the procedure was painless, practically bloodless, and the convalescence was comfortable and brief.

The technique was as follows:—

On the evening prior to the operation the patient was given pento-barbital sodium, and this was repeated an hour prior to operating. In the morning he had a hypodermic injection of morphine sulphate gr. ¼ and of scopolamine hydrochloride gr. 1/150. The face was cleansed with soap and water, painted with 3 per cent. iodine, and, finally, sponged with alcohol. A black helmet, exposing only the field of operation, was drawn over face and head and fastened about the neck. The nose on the operation side was packed with cotton pencils which had been wrung out with a solution of epinephrine hydrochloride 1 in 2000 containing 10 per cent. cocaine. The incision area about the inner canthus of the eye was infiltrated with a 2 per cent. solution of procaine hydrochloride containing 25 ♏ of epinephrine hydrochloride to the ounce. The eyelids were closed by means of a horsehair suture for the protection of the cornea. The incision should begin immediately below the eyebrow and should be ¾ inch long. The superior palpebral vessels were incised between two forceps and ligated with 00 size plain catgut. The incision was continued through periosteum to the bone. The ligaments about the lacrymal sac were exposed and incised, and the sac was turned outward and downward until the duct was exposed in the floor of the fossa. The peri-orbital tissue was freed with an elevator from the lamina papyracea and the floor of the frontal sinus. The mesial orbital wall was perforated through the lacrymal fossa with a sharp perforator, and enough of the posterior margin of the nasal process of the maxilla was removed to permit of complete exenteration of the lining of the most anterior cell and to afford a clear view. The lamina papyracea was now removed with a Gruenwald punch forceps, leaving a wall 3/16th of an inch high along the orbital floor, when the condition of the bone permitted. The forceps introduced through the nostril removed most of the ethmoid cells and left the lateral wall of the middle turbinal clearly exposed. With a Sluder ethmoid knife the turbinal was slightly fractured. The remnants of the ethmoid cells were completely removed with punch forceps, and the nasal roof completely freed from covering membrane by the use of small gauze balls. Every vestige of membrane must be cleared away and the bone left clean. The sphenoid was dealt with by means of a Sluder knife introduced into the ostium; very seldom indeed had he needed to use a chisel to enter this sinus.

Dr. Ferris Smith said he had used the method on more than 500 patients. Most of them complained of post-operative headache but never of actual pain; this headache persisted for from 3 to 30 days. A diplopia persisted for a similar time. In 5 cases there was a recurrence of small polypi; a few resisted all efforts to check the discharge of mucus. After about two months the operation scar was scarcely visible. He used local anæsthesia, and there were only slight post-operative reactions.

DISCUSSION

Mr. A. LOWNDES YATES said that if simple measures could be made adequate, and especially if patients came for treatment at an early stage, major operative measures on the sinuses would be very rare. In successful operation cases the discharge consisted of muco-pus containing leucocytes but few epithelial cells, and in the latter the micro-organisms were intracellular. When operation did not stop the discharge, the latter showed a few pus cells, many epithelial cells, and quantities of micro-organisms which were not dissolved by the bactericidal action of the mucus. His experience led him to believe that when free micro-organisms were present in the discharge, palliative measures gave better results than operative ones. In obstructive sinusitis cilia were active and were able to bring about a cure if the mucous membrane of the ostium was shrunk with cocaine. In open sinusitis the ostia inflammation was maintained by the ability of the micro-organisms to survive in the secretion, and the ostia was not obstructed. In many cases having abnormalities in the nasal airway one channel did nearly all the work of removal of infection from the inspired air.

Mr. T. B. LAYTON insisted on the dictum of Lister, that an inflammation tended to get well of itself if the cause of irritation was removed. He discussed the question whether the new opening should be made into the middle or the inferior meatus, and, if the latter, whether it should be approached by the intranasal or the sublabial route. If the procedure were properly carried out and the case was not complicated, chronic maxillary suppurative sinusitis would get well. The problem in regard to the other sinuses was more complex. The chief cause of failure in the past had been to consider mainly frontal sinusitis, whereas the key to all fronto-ethmoidal suppuration was the maxillary sinus. Intermittent drainage of the latter might cure a fronto-ethmoiditis; if it did not do so in a reasonable time, the products of inflammation of the maxillary sinus should be diverted from the middle meatus to the inferior. This would remove the irritation of the mucous membrane at the front end of the semilunar groove.

Mr. C. GILL-CAREY said that, technically, he agreed with Dr. Ferris Smith. Several years ago he became dissatisfied with the results of his intranasal operations on the ethmoid, and therefore adopted the external method, since when his results in the ethmoid had become very good. Results were also good in frontal sinus cases, but in some only for a limited time, as a year or two afterwards there was reinfection and the sinus opening became stenosed. Skin-grafting had not proved a successful remedy in his hands. A similar trouble was encountered in the sphenoid. He joined issue with Dr. Ferris Smith as to the type of case in which the operation described was necessary. The speaker had operated upon a number of asthmatics, and the results were equally good but for a shorter time. His view was that there occurred an allergic change in the nose, which affected not only the linings but the septum and the turbinates. He felt that if removal of mucous membrane were to benefit asthmatics, all parts should be attended to.

Mr. WALTER HOWARTH said that the technique described by Dr. Ferris Smith was almost identical with that which he himself had introduced in 1921 and had carried out since then, but he had different views in regard to the treatment of the mucous membrane. Dr. Ferris Smith said that he had never found a mucous membrane which was fit to be left behind; moreover, he operated not only on the ethmoid and frontal sinus but also on the sphenoid, implying that every case was a pan-sinusitis. Such virulent types of case were not usual in Britain. In many fronto-ethmoidal cases the sphenoid was not involved, and in many cases of fronto-ethmoidal suppuration the frontal sinus mucosa was not full of abscesses and underlying osteitis. In Mr. Howarth's view the mucous membrane of the frontal sinus should not always be removed unless it was grossly diseased; if it could be safely left behind, so much the better for the patient. His main difficulty in these cases had been to maintain the patency of the new fronto-nasal duct; but since using skin-grafting his results had been better.

Mr. H. G. BEDFORD RUSSELL said that he had been trying out Dr. Ferris Smith's methods, which were the outcome of 16 years of research, for a few months and was able to confirm his statement that patients were free from post-operative distress and from an obtrusive scar. With regard to the healing process, the possibilities lay between an obliteration of the cavity by sclerosis and the persistence of a cavity lined with squamous epithelium. Whereas when the patient was suffering from septic absorption from the sinuses the complete operation was the only logical course, it could be employed with advantage in the treatment of anterior sinusitis only when the essential trouble was mere mechanical difficulty in ventilation or drainage of the frontal sinus. He had had excellent results in this way, though with delayed healing in one or two cases. Where the antrum and posterior group of sinuses only were causing trouble he had been satisfied with the results of Horgan's transantral approach.

Mr. G. H. HOWELLS explained that his contact with sinus cases specially concerned those with orbital complications which he encountered at Moorfields. In these he followed Mr. Howarth's technique and had been satisfied with the results. He agreed that often it was unnecessary to denude the fronto-nasal mucous membrane; frequently the upper and back parts of the mucosa could be left. In the antrum he favoured conservatism, trying first the intranasal procedure. As to stenosis of the fronto-nasal duct after operation, if a part of the nasal process of the maxilla was removed, the opening afterwards was less likely to stenose.

Mr. H. A. KISCH felt satisfied that the only means by which permanently satisfactory results could be achieved in frontal and other sinus cases was by the external approach. He had never used skin grafts to maintain opening into the frontal sinus. He agreed it was important to remove the ascending process of the maxilla to get a free opening into the frontal sinus. He used general anæsthesia for his cases.

Mr. E. WATSON-WILLIAMS thought Dr. Ferris Smith's outlook was unjustifiably gloomy. He found that, unless the condition was really desperate, most patients declined, on cosmetic grounds, to submit to the external operation, whatever they might be told as to the insignificance of the scar. He had only

exceptionally found it necessary to do the external operation. It seemed unnecessary to sacrifice the turbinal in order to secure adequate drainage of the sinuses. The test of success of operative procedures was whether the patient could, with a minimum of inconvenience, get rid not only of his symptoms, but also of his irido-cyclitis and any rheumatic troubles. In only a small proportion of chronic sinus cases was it necessary to do more than provide adequate ventilation and drainage.

Mr. HERBERT TILLEY paid a tribute to the fine technique and operative skill of Dr. Ferris Smith.

Sir JAMES DUNDAS-GRANT commented on the absence from Dr. Ferris Smith's armamentarium of instruments of the sharp-edged punch, which enabled portions of tissue to be brought away without tearing; it had helped him in many cases of ethmoidal suppuration. He had a leaning towards the Canfield operation.

Mr. J. F. O'MALLEY understood that Dr. Ferris Smith's fundamental intention was the eradication in these chronic cases of persistent osteitis, which nearly always interfered with the efficiency of drainage. When failure occurred he believed it was from underdoing the operative procedure, rather than because a too extensive procedure had been carried out.

Mr. W. STUART-LOW considered that lavage was the worst thing for ethmoiditis as the micro-organisms wanted water, and this also helped their dissemination to other parts. He was an advocate of suction for the removal of the infection from the sinuses.

Mr. F. C. W. CAPPS said Dr. Ferris Smith confessed to him that the operation owed much of its success to the preparation of the patient beforehand, and this he entrusted to those only whom he had himself trained for many years. Many left the preparation in other hands, and often one felt that reliance could not be placed on it having been done thoroughly. Since he had done his own preparation his results had certainly improved.

ASSOCIATION OF CLINICAL PATHOLOGISTS

THE seventh annual meeting of this association was held at the Royal Chest Hospital, London, on Jan. 26th. Dr. NORAH SCHUSTER, pathologist to the hospital, occupied the chair.

Dr. ROODHOUSE GLOYNE (London) delivered an address on the

Clinical Pathology of the Pleural Fluid

He pointed out that cytological examination of such fluid was difficult if it were allowed to clot and advocated its collection in two tubes, one sterile for bacteriological examination and one containing a little 1 per cent. sodium citrate. The appearance of the fluid as collected offered valuable information; the presence of blood suggested malignant growth; the specific gravity and the total protein were of importance in distinguishing between a transudate and an exudate; fluids showing less than 1·5 per cent. of total protein were probably transudates; if the protein was above 3·0 per cent. they were pretty certainly exudates. For the examination of the cells Dr. Gloyne advocated Gordon's modification of Pappenheim's stain. He was doubtful whether the cells usually described as lymphocytes actually were such; they were characteristic of established tuberculous effusions. In the earlier stages polymorphs might predominate. Eosinophils might appear in the exudate in large numbers in traumatic hæmothorax, after artificial pneumothorax, in association with malignant disease and in the presence of an unresolved pneumonia. New growth cells were very difficult to distinguish from pleural endothelial cells; their cytoplasm was usually vacuolated and the vacuoles contained a material staining yellowish-brown with osmic acid. In bacteriological examination Dr. Gloyne stressed the necessity of anaerobic as well as aerobic culture. Anaerobic streptococci which gave rise to a particularly virulent form of pleural infection might escape detection on simple aerobic culture. Tubercle bacilli could often be identified in films after careful examination, but would escape detection in many cases in which they might be found either by guinea-pig inoculation or by the use of Loewenstein's medium. Pleural puncture was a safe procedure, but he had experience of one case of severe hæmorrhage and one of tuberculous infection of the needle track following it. Dr. Gloyne stated that the number of new growths of the lung met with in post-mortems at the Victoria Park Hospital showed a steady increase and was now 15 per cent. of all performed there. He had seen one case in which a troublesome local tuberculous infection was produced by the reinjection of tuberculous pleural fluid; he deprecated the injection of pleural fluid until it had been passed through a filter and shown to be sterile.

Dr. ARTHUR DAVIES (London) divided pneumococcal pleural effusions into the syn- and meta-pneumonic. The appearance of the former coincided with the onset of pneumonic infection, the latter appeared from seven to ten days after its establishment. The syn-pneumonic effusions were characterised by the presence of few pus cells and many organisms; the meta-pneumonic by many pus cells and fewer organisms. Dr. Davies pointed out that at the time of appearance of the syn-pneumonic effusions little reaction had occurred in the tissues and that puncture at this stage might set up the dangerous condition of "mediastinal flutter." Milky fluids might be either chylous or pseudo-chylous; the former contained actual fat and were almost invariably indicative of filarial infection; the latter owed their opacity to material of a lipoid nature and might occur in a number of conditions. He drew attention to the importance of infection below the diaphragm, as for instance the presence of an amœbic abscess in the liver as a cause of sterile purulent effusion in the pleural sac.

Dr. JAMES MAXWELL (London) advocated the use of the Rotanda syringe for the collection of pleural fluid; by means of it almost any amount of fluid desired could be conveniently withdrawn at one puncture. Previous puncture he regarded as the most common cause of the appearance of blood in the pleural fluid. Speaking of the appearance of pleural fluid, he cited one instance in which an artificially induced oleothorax had been mistaken for an empyema; one in which the instillation of methylene-blue had led to a diagnosis of pyocyaneus infection and one in which puncture had resulted in the appearance of clear watery fluid; subsequent examination of this fluid showed hooklets and scolices and established a diagnosis of hydatid disease of the lung.

Dr. A. F. SLADDEN (Swansea) drew attention to the globulin test as a means of distinguishing between

transudates and exudates. When slide preparations of pleural fluids were flooded with 5 per cent. acetic acid transudates remained unaltered but exudates became coagulated.

The CHAIRMAN asked for information as to the nature of the "Foulis" cell.

Dr. ROODHOUSE GLOYNE replied that he had searched the literature for information as to the nature and appearance of this cell, but had only found one short reference. Briefly, he considered that the large cells with vacuolated cytoplasm found in the pleural fluid and usually described under this name were probably indicative of malignancy if the vacuoles contained lipoid material but not if the vacuoles were empty.

Dr. G. W. GOODHART (London) drew attention to the usefulness of screw-topped bottles, as supplied by the L.C.C. laboratory service, for keeping media such as Loewenstein's moist and in good condition.

Dr. L. E. H. WHITBY (London) described the direct typing of pneumococci. He pointed out that in the early stages of pneumonia, when typing is necessary, the sputum contains only few pneumococci. In making preparations it was necessary to take four samples from one specimen of sputum. One of these was kept as a control; the remaining three were well mixed with drops of I., II., and III. typing serum respectively. The drops of sputum and serum were allowed to stand for from two to three minutes, then covered with a slip and examined microscopically. Pneumococci subjected to the action of their homologous serum showed swelling and opacity of the capsule. Dr. Whitby laid stress upon the fact that the examination was one requiring considerable skill and experience and not to be lightly undertaken.

Autopsies on Cardiac Cases

Dr. JOHN TAYLOR (London) recorded the findings in 300 post-mortems (75 per cent. males) on cases of sudden death from cardiac causes. Only 8 per cent. of the subjects were below the age of 40 and only 9 per cent. over 80. Myocardial disease accounted for 56; in this class Dr. Taylor included with some trepidation one case of what he could only describe as "status lymphaticus." Coronary disease accounted for 116 of the cases; in 20 of these there was rupture of the ventricle, in every case due to thrombosis of the left coronary; valvular disease only accounted for 24 of the total. In one case death was due to "shock" following the introduction of soapy water into the pregnant uterus.

Dr. SKENE KEITH (London) found a very similar causal distribution in 110 cases of sudden death. He showed diagrams of the size, shape, and position of the heart made by plotting the cardiac outline upon the surface of a plate of glass superimposed upon the heart after opening the chest wall. These diagrams showed that the heart occupied a position differing considerably from that described in the text-books of anatomy.

Dr. W. BARNARD (London) attributed sudden death after coronary thrombosis to ventricular fibrillation; he pointed out that in those cases in which death occurred immediately on the establishment of a coronary thrombosis no evidence would appear in the heart muscle of the damage done; histological evidence of infarction could not appear unless life were prolonged for some time.

Dr. E. WORDLEY (Plymouth) described a case of sudden death in which at post-mortem he had found widespread fragmentation of the heart muscle; he inquired whether this was the cause of death or a post-mortem phenomenon. Dr. Taylor stated that he believed fragmentation of the heart muscle to be a post-mortem phenomenon; and in answer to an inquiry by the chairman, said that his personal experience had led him to believe in the existence of "status lymphaticus."

Sedimentation-rate

The CHAIRMAN described a comparative investigation into methods for the estimation of the sedimentation-rate of the red cells. She deplored the misplaced ingenuity which had gone to the modification of the original techniques of Fahraeus and Westergren which she regarded as still being the best available. Using a capillary tube method she had obtained very irregular results. Factors influencing the rate of sedimentation were bore of tube, height of the blood column, the anticoagulant, the degree of anæmia, the type of blood, whether venous or capillary, and the temperature. The height of the blood column was of great importance; with a column of 200 mm. the level of the red cell column at the end of an hour depended solely upon the rate of fall of the cells; with a 100 mm. column the additional factor of packing was introduced. Dr. Schuster pleaded for standardisation of the technique in order that the results of different workers might be comparable which at present they certainly were not.

Demonstrations

Dr. C. DUKES (London) showed specimens of carcinomatous rectums removed at operation. Dr. Dukes also showed graphs demonstrating the progressive deterioration in the prognosis after the growth had passed through the mucosa into the rectal wall; by investigation of the degree of invasion of the regional lymph glands he had been able to divide cases of carcinoma of the rectum submitted to operation into three prognostic categories.

Dr. EILEEN HARVEY (London) showed a large series of lung lobes successfully removed by surgery at the Hospital for Consumption, Brompton.

Dr. W. E. CARNEGIE DICKSON (London) showed specimens of cerebral tumours and other brain conditions.

SOCIETY OF MEDICAL OFFICERS OF HEALTH

AT a meeting of the Fever Hospital Medical Services Group held on Jan. 25th, Dr. H. S. BANKS being in the chair, a paper on the

Treatment of Cerebro-spinal Fever

was read by Dr. JOSEPH M. KENNEDY (Lodge Moor Hospital, Sheffield). During the years 1931–32–33, 369 cases of cerebro-spinal fever, he said, were admitted, of which 132 died: a case mortality-rate of 33 per cent. Of these 132 deaths, 52 occurred within 48 hours of coming under treatment; deduction of these cases gives a case-mortality of 25 per cent.

AGE-INCIDENCE AND DEATH-RATE

Age.	Cases.	Deaths.	Case-mortality per cent.
Under 1 year	25	15	60
1 year and under 5 years	76	25	33
5 years and under 30 years	218	67	31
30 years and over ..	50	25	50
Total	369	132	33

Before 1931 serum prepared from previous epidemic strains was being used; since then serum produced

rom the strains reponsible for the prevalent epidemic. In my opinion, said Dr. Kennedy, the intrathecal route is the best, and gives the most satisfactory results. I used this method in all cases, and, where there were signs of a septicæmia, as indicated by the appearance of purpuric or petechial hæmorrhages, intravenous and intramuscular injections were used in addition. Of the 188 cases which recovered during 1932–33, I found that meningococci disappeared completely from the cerebro-spinal fluid after one intrathecal injection in 98 cases (or 52·1 per cent.), and in 148 cases (or 78·7 per cent.), after three consecutive intrathecal injections of serum. I believe that the presence or absence of the organism in the cerebro-spinal fluid is the only criterion by which we can form an opinion of the value of the serum; in 81 per cent. of the deaths the cerebro-spinal fluid remained persistently positive in spite of daily intrathecal injections of serum. A dry lumbar puncture usually indicates a blockage of the foramina of Luschka and Majendie in which case ventricular puncture will alone relieve the cerebral pressure. This can be easily done in infants. I prefer, he said, to do all lumbar punctures under local anæsthesia and to avoid general anæsthesia, except in those cases where the patient is wildly delirious and a general anæsthetic is unavoidable.

Dr. Kennedy regards the typing of the meningococcus during an epidemic as very valuable, as the particular type is always kept in view; thus any change that may occur in the types is recognised and, if necessary, the serum altered. He finds it unnecessary to use a multivalent serum containing all four types during an epidemic, as the particular type responsible for the epidemic is constant. Until the type is identified, one is fully justified in using a group serum. During an epidemic of cerebro-spinal fever, when a patient complains of headache and has some pain or tenderness on flexing the head, not necessarily neck rigidity, the cerebro-spinal fluid should be examined without further delay. One cannot stress too much the great importance of lumbar puncture in infants, in cases where there are no definite signs or symptoms of meningeal irritation other than pyrexia with fretfulness or irritability. I am convinced, Dr. Kennedy concluded, that a number of infants die during an epidemic when the disease is not even suspected.

Dr. ALEX. JOE (N.W. Hospital, L.C.C.) stated that in recent years meningococcal meningitis had only appeared sporadically in London and in 1932–34 exactly 50 cases had come under his care. The gross fatality-rate was 50 per cent. Intensive drainage by frequent lumbar puncture, cisternal and ventricular puncture, and serum administration by these and the intravenous routes, while sometimes appearing of great value in individual cases, had not produced any striking superiority statistically over the daily lumbar puncture and serum administration practised by him in former years. He had found that prognosis depended on two main factors—viz., the age of the patient and the type of infecting organism. In his series of cases the most favourable age period was 5–20 with a case-fatality of 29·4 per cent., whilst under 5 it was 58·8, and over 20, 62·5 per cent. Forty-one of the infecting strains had been typed, 28 belonging to Group I. and 13 to Group II. In Group I. cases the outlook was better than in Group II. the former showing a case-fatality of 42·8 per cent. as compared with 84·6 per cent. in the latter. Surprisingly in his cases the day of disease on which serum was administered did not seem to have affected the issue very much. When given on or before the third day it was 45·4 per cent. as against 53·5 per cent. after the third day.

The PRESIDENT referred to Ferry's work on the isolation of soluble toxins from the meningococcus and the preparation of a polyvalent antitoxin. He had had the opportunity of treating a small series of cases with Ferry's antitoxin and was impressed with results obtained in bacteriological Type I. cases. Severe cases however appeared to require an intensive mode of therapy in the early acute stage—e.g., twice daily spinal serum in the first three or four days combined with one or two intravenous injections. Cisternal puncture should be done under a general anæsthetic during the irritable and acute stage, and a fine sharp needle should be used, as there was a danger from cisternal hæmorrhage. If a case was not responding to treatment after five or six days, double ventricular puncture and injection of serum might be found useful not only in infants but at higher ages. This was a simple and painless operation which could be readily performed by means of Purves Stewart's modification of Goetze's channel borer.

Dr. G. F. PETRIE (Lister Institute, Elstree) referred to the significance from the clinical standpoint of a specific anti-endotoxic component in antimeningococcus serum. He commented on the considerable difficulties that were met with when the problem was investigated by the usual experimental methods, and pointed out the difference in this respect between antimeningococcus serum and the ordinary antitoxic sera, such as tetanus antitoxin. The ease with which many multiples of the lethal dose of diphtheria or tetanus toxin could be neutralised by the corresponding immune-serum, even when the serum-toxin mixture was injected into highly susceptible tissues, contrasted with the difficulty of demonstrating the presence of a specific antibody which was capable of neutralising the endotoxin of the meningococcus.

Dr. R. A. O'BRIEN said that standardisation of the antiserum was very unsatisfactory, there being no generally accepted method. Wadsworth attached great importance to the agglutination titre tested against chosen cultures. All one could do was to use this method and to employ for immunisation as fresh cultures as were available through the courtesy of the Ministry of Health.

Surg.-Captain S. F. DUDLEY, R.N., said that, though it was rare, more than one case of cerebro-spinal fever did sometimes arise in the same family. For instance during the war a sailor, who was afterwards proved to be a carrier, went home on leave. Shortly after, both his wife and child died of the fever. Case to case infection is so rare in spite of the fact that there must sometimes be over a thousand carriers to each case of meningitis. Lately, for example, there had been an extraordinary prevalence of cerebro-spinal fever carriers in Chatham; over 50 per cent. of the samples examined carried *agglutinable* meningococci during a period of over a year in which no case of the fever had been admitted to hospital. The great difficulty of assessing the value of different methods of treating this disease was, he said, due to the great variation in the case-fatality and clinical picture of cerebro-spinal fever at different times and places, irrespective of the therapeutic measures employed. Referring to the President's case of intracranial hæmorrhage following cisternal puncture, Captain Dudley said he had seen a case of intraventricular hæmorrhage in a man who was apparently convalescent from fever, but this case had never had a cisternal puncture. He drew attention to the fact that odd cases of meningococcal

septicæmia were not infrequent during outbreaks of cerebro-spinal fever. In such patients there might be no symptoms of meningitis, and the lumbar puncture fluid might remain clear throughout. These cases were not necessarily fatal, and could only be recognised with certainty by cultivation of *N. meningitidis* from their blood.

Dr. J. S. ANDERSON referred briefly to the infrequent development of the disease in carriers and quoted a case from his own experience. He also made reference to an improvised method of performing ventricular puncture after the fontanelle had closed.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION

AT a meeting held on Jan. 22nd, with Dr. E. M. PICKARD, the president, in the chair, Dr. ISABEL WILSON read a paper on early diagnosis and treatment of

Some Common Mental Disorders

She said that it would be logical to begin with mild symptoms of mental illness or mild types and work up to the more severe, but it was pleasanter to attack the problem the other way round so as to arrive at some discussion of the ways in which the general practitioner might deal with nervous or mental illness.

Delusion was a serious symptom; when expressed it was often considered merely silly, or wrong, by the relatives. It was for the doctor to look at it scientifically, leaving moral judgments out of the question, and to recognise it as a symptom of illness. In considering a particular deluded patient for whom certification was necessary, it should be remembered that under the Mental Treatment Act removal direct to a mental hospital, under an urgency order signed by the authorised officer of the local authority, was now possible for the rate-aided patient. Delusion was not necessarily ground for certification, though it did usually imply unsoundness of mind. A patient might be deluded and yet fit to be a voluntary patient.

Confusion was easy to diagnose. The duty of the doctor here was not so much to recognise the condition as to recognise the need for skilled nursing and medical care. Patients might suffer quite seriously in hospitals or nursing-homes, where general medical and surgical care was all that could be desired, for want of doctors and nurses with practical experience in caring for the very confused and restless. To warm, feed, wash, and generally nurse a patient who might roll over and over or struggle and hit out when approached demanded the help of those whose business it was to treat patients of this kind before it was too late. Temporary treatment under the Mental Treatment Act was suitable for this type of patient, who must be for the time being incapable of expressing himself as willing or unwilling to receive treatment. The relative, or the authorised officer of the local authority, made application; there was a medical recommendation in two parts, one, preferably, by the usual medical attendant and the other by a doctor approved to make such recommendations. Some patients so dealt with would be suffering from psychosis during the puerperium. In a proportion of these, the prognosis is good. In others, the confusion might mask a schizophrenia which showed itself to everyone for the first time during pregnancy or the puerperium. It would probably have been recognisable much earlier by an expert.

Schizophrenia, which included the form of illness known to some as dementia præcox, might present some of the following features: perhaps a family history of mental breakdown; a physique slender and "asthenic," or dysplastic; more than usual shyness and "oddness" in childhood, though the frequency of this was not established; sometimes an alleged artistic brilliance which on consideration was found to be the power of producing drawings or writings which were striking and unusual, rather than an all-round excellence; occasionally real artistic, musical, or intellectual brilliance; negativism, a tendency to decline opportunity and sociability; increasing lethargy and indifference; mannerisms and grimacings, and later, hallucinations. Adolescent breakdown of simpler kind and better prognosis might be just as severe at the time. The diagnosis between these two conditions might be difficult. In seeking for help in such a diagnosis out-patient clinics were useful.

The early diagnosis of *depression*, to consider only this aspect of manic-depressive psychosis, was most important. In youth particularly the prognosis was good, but the patient might put herself out of a high window while the need for further steps was under consideration, and would most certainly elude the most conscientious vigilance of relatives or nurses untrained in the treatment of mental illness if she had a mind to do so. Even in expert hands some patients were very difficult to treat. Depression might be shown by retardation of thought and speech, by insomnia, particularly in the early morning; and by gloom improving during the day. There was usually but not invariably increasing physical ill-health, and loss of interest in the family and general affairs; there was depression and perhaps self-reproach. Prompt treatment in expert hands was essential. A depressed patient might be suitable for voluntary treatment; all she had to do was to write or sign a letter of application to the person in charge of the hospital asking for treatment. It was of course unwise to over-persuade an unwilling patient to sign such a form; she would only give in her notice to leave at the first possible opportunity. It was not only unwise but gravely unfair and dangerous to send for treatment as a voluntary patient one obviously bent upon suicide and determined to ask for her release for such a purpose. On the other hand, the patient who truly wished for treatment was the leaven of the hospital, and the change in the proportion of voluntary to certified patients which was taking place gradually should be a satisfaction to all concerned.

The *neuroses*—hysteria, neurasthenia, and the like—come more often under the direct care of the general practitioner. Some of these cases needed psychotherapeutic help; others, of less advanced degree, might complicate physical illness or show comparatively minor symptoms. However much the orthodox would like to see all neuroses treated by the specialist, many cases had to be dealt with by general practitioners. Dr. Wilson enumerated certain principles which might help toward the decision which cases should be so dealt with.

GERMAN SOCIETY FOR STUDY OF THE CIRCULATION. The eighth congress of the Deutsche Gesellschaft für Kreislaufforschung will take place at Wiesbaden on March 24th and 25th under the presidency of Prof. E. Koch, Bad-Nauheim. The main subject for discussion will be circulation and respiration, and the principa speakers will be Prof. W. R. Hess (Zurich), Prof. K. F. Wenckebach (Vienna), and Prof. M. Hochrein (Leipzig). Those who wish to attend should communicate with Prof. Koch before March 1st.

REVIEWS AND NOTICES OF BOOKS

Clinical Science Illustrated by Personal Experiences

By Sir THOMAS LEWIS, C.B.E., F.R.S., M.D., D.Sc., LL.D., F.R.C.P., Physician in charge of Department of Clinical Research, University College Hospital, London. London: Shaw and Sons, Ltd. 1934. Pp. 189. 12*s*.

IN this book Sir Thomas Lewis states first his views on the essential qualifications and aims of workers in clinical science, which claims at least as much of sacrifice and devotion as it offers of reward. But that the reward is to be gained, and has already been gained, in the form of definite advances in our understanding of certain states of disease in man, is made clear in the second part of the work, where examples of the advances are recorded. These have been described before in medical journals; they are now reproduced in a form which differs from the previous publications as does an autobiography from contemporary history. Those unacquainted with the pieces of work recalled will learn many facts of outstanding value; others, already familiar with them, will be thrilled by the story of the ways in which the problems came to be studied, of the processes of analysis to which they were subjected, and of the rigidly logical sequence of observation and inference upon which their solution now rests. Most of these investigations sprang from apparently trivial initial happenings—the occurrence of some accidental injury, the after-effects of a game of snowball, a casual observation made in the course of some earlier work, and so forth. The first impression gained from reading these chapters may be that more than his common share of these "fortunate accidents of observation" has fallen to the lot of the author. It is one of Lewis's main contentions that this impression would be false, that "there are abundant problems of every grade from simplicity to complexity" presented to each of us by nearly every patient with whom we are brought into contact.

The chief chapters are on auricular fibrillation and flutter, on the responses of the skin to injury, on vasomotor activity, Raynaud's disease and erythralgia, on the pains of intermittent claudication and of cardiac angina, and on subacute bacterial endocarditis. Each is the account of a fresh scientific adventure. The final three chapters deal with diagnosis, with prognosis, and with therapeutics. A plea is made for the elimination from diagnosis of what remains of the empirical and for the substitution of rationalistic principles; the author is not here concerned with diagnosis—"the art of diagnosis" is clearly no concern of "clinical science"—he is concerned with "defining conditions of disease." Prognosis, especially of chronic disease states, is claimed to be too often based upon general impressions of personal experience and not, as it should be, on collected and published records of the life-histories of groups of unselected patients. With regard to therapy, the author holds that "clinical science may discover completely new remedies for disease, but it will only do so by developing a greater understanding of disease and of the reactions of the body." Outside this particular chapter on therapy and the introductory chapter, only once is mention made of help given in "the management of patients"—i.e., in treatment, and those who, having earlier read that "the chief goal of clinical science is to devise new and better methods of treatment," look further for signs of progress towards this end, will be disappointed.

There will be some, perhaps many, who disagree with Lewis in his appeal for the pursuit of knowledge for its own sake, divorced from therapeutic applications; but this appeal is, after all, only a verbal gesture. Knowledge never has been pursued for its own sake, but for the personal satisfaction that its pursuit brings. Since the management of the individual patients is left to those possessed of a clinical sense, and clinical science views them merely as material in which reactions to disease can be observed, measured, and if need be provoked, some will feel also that the unfortunate victims of disease who provide this material will deserve more than their ordinary share of posterity's thanks—gratitude which, as Mr. Wilfred Trotter has pointed out, they so often merit and so seldom get. Such feelings would be superfluous so far as Lewis's own patients go, for they are loud in his praise, as all know who have worked with him. This is one of the facts, known to his pupils, that Lewis does not convey in his book. Those who have not themselves come under the influence of his inspired teaching will find a message which no one can read without interest and few without delight.

Physical Diagnosis

Eleventh edition. By RICHARD C. CABOT, M.D., Emeritus Professor of Clinical Medicine in Harvard University. London: Baillière, Tindall and Cox. 1934. Pp. 540. 22*s*. 6*d*.

MODERN practitioners are apt to invoke laboratory and other accessory aids before rather than after they have exhausted the findings of their own five senses. Prof. Cabot makes us aware how much more we could use our personal equipment in daily routine. Many years ago he wrote in a book entitled "The Training and Rewards of a Physician," that "the capacity for blindness to what is right under our noses is so deep and human a quality that we are not always certain of wisdom increasing with the advance of years." Few men need have so little apprehension on this score as the author, the eleventh edition of whose work is a fine testimony to the wealth of clinical observation he has accumulated. Many of his dicta are expressed in a way which appeals alike to reason and to memory. An admirable account of sputa ends with the note: "Muco-purulent sputum occurs in many diseases and is characteristic of none." To no doctor who was not also a musician would it have occurred to say that in asthma and bronchitis "one may have quite complicated chords from the combination of râles which vary in pitch." The emphasis laid on the fact that if a diphtheritic patient survives the acute myocarditis there are no permanent effects left on the heart is timely. Few physicians would admit so frankly the limitations of physical methods of diagnosis in certain conditions. "Till 1921," he says (p. 363), "I thought I could recognise emphysema. The following facts have disillusioned me. In 12 cases diagnosed at the Massachusetts General Hospital, only 3 showed any emphysema post mortem. On the other hand, of the 153 cases demonstrated post mortem only 7 were recognised in life. I am now convinced that this clinical entity (barrel chest, hyper-resonance, and feeble prolonged expiration, &c.) is usually not connected with emphysema and

that the pathological entity 'emphysema' can be recognised only by careful radiological study. *I know to-day nothing about the physical signs of emphysema.*" The stamp of Prof. Cabot's personality and sincerity, his occasional heresies, which are the fruits of long experience in clinical medicine, and most of all his modesty, make of these pages a real refreshment.

Surgery of a General Practice

By ARTHUR E. HERTZLER, M.D., Chief Surgeon, Halstead Hospital; and VICTOR E. CHESKY, M.D., Chief Resident Surgeon, Halstead Hospital. London: Henry Kimpton. 1934. Pp. 602. 42s.

THE tendency of modern hospital technique is towards over-elaboration, so that the general practitioner is less and less inclined to undertake small operations. This situation the authors hold to be deplorable and quite unjustifiable, and the worthy object of their book is to instruct the practitioner in the simplest methods of treating minor surgical conditions. Dr. Hertzler and his collaborator state frankly that they do not know the limits of minor surgery. Certainly many conditions described in this volume would be much better treated in a hospital than in a surgery. But on the whole they have succeeded in simplifying therapeutics by describing one well-tried method only for any particular lesion. The advice given is well chosen. Stress is laid upon early diagnosis, and to this end many uncommon conditions are described and often depicted in the series of good photographs reproduced. This sort of book is most difficult to write and therefore most easy to criticise; but the practitioner who consults these pages may be sure of obtaining sound advice and adequate instructions on how to carry out minor surgical procedures.

Voluntary Sterilisation

By C. P. BLACKER, M.C., M.D., M.R.C.P., General Secretary of the Eugenics Society. London: Humphrey Milford, Oxford University Press. 1934. Pp. 145. 5s.

THE case for sterilisation, according to the author of this well-written book, has suffered in the past from the intemperate advocacy of those who have appreciated neither the complexity of the factors underlying hereditary disorders nor the limitations of sterilisation as a means for their eradication. In connexion with mental defectiveness, it has been held up as a panacea by which the number of affected persons could be drastically reduced in a few generations (or, even more optimistically, years), and indeed as "the only possible check to a process of wholesale racial degeneration"; and, supplementing idealism by an appeal to the pocket, it has been represented as an alternative to segregation which would allow of the closing down of many institutions, thus effecting valuable economies for the ratepayer. By such exaggerations, the cause of sterilisation has been so discredited that before 1930 it "had practically no support in England from social workers, institutional superintendents, and other psychiatrists." This book, by contrast, could serve to propagandists as an exemplification of the value of carefully calculated understatement. It makes a convincing case in favour of the recommendations of the Departmental Committee on Sterilisation which reported in January, 1933, by the commendable expedient of letting cautiously stated facts speak for themselves. In a series of chapters dealing in order with the history of sterilisation in England, the nature of sterilising operations, sterilisation and the law, hereditary defects and diseases, the fertility of defective-producing classes and stocks, sterilisation abroad, and safeguards against abuses of eugenic sterilisation, the author builds up an argument that is the more secure for having conceded to opponents of sterilisation all that is valuable and cogent in their case. The chapter on voluntary and compulsory sterilisation deserves special mention; it disposes completely of the opposition to the Departmental Committee's recommendations which is based on the assumption that "voluntary measures are the thin end of a wedge of which the thick end is compulsion," and offers a valuable statement of the irreconcilable differences between what may be termed English and Nazi eugenics.

In a preface the author states that his book has been written mainly for the layman; but it can be recommended to the medical profession as the most concise and best-informed statement of the case for voluntary eugenic sterilisation that has yet been published.

Clinical Studies on the Physiology of the Eye

By J. GRANDSON BYRNE, M.A., M.D. London: H. K. Lewis and Co., Ltd. 1934. Pp. 144. 10s. 6d.

THIS somewhat involved study of the clinical applications of the physiology of the sympathetic and parasympathetic systems follows on the same author's "Studies on the Physiology of the Eye," published last year. He appears to aim at a restatement from a clinical point of view of the work of Langley and Anderson, Head, Rivers, Karplus and Kreidl, and other workers in this field, but the result is somewhat vitiated by the use of a terminology difficult to follow. We fail to see why the terms "narrowing" and "convexing" should be synonymous when applied to the lens, nor is the phrase "accommodation for distance" usually taken to mean relaxation of the ciliary muscle. A large part of the clinical section is taken up with a description of cases showing inequality of the pupils and disturbances of accommodation under various conditions, and in no case is the patient's refraction taken into account. Inequality of the pupils was found and was considered to have a diagnostic significance in a large number of conditions, including fractures of long bones, chronic ulcer of the leg, ulnar neuritis, abscess of dorsum of foot, dislocation of hip, rupture of popliteal nerve, gastric ulcer, ovarian cyst, ureteric calculus, hydronephrosis, aortic disease, and acute pleurisy.

The book ends with a somewhat unorthodox chapter on the treatment of asthenopia in which alternating periods of rest and exercise are advocated, e.g., (p. 137) "The influence of rest properly alternated with exercise for the whole body as well as for the external ocular muscles upon the conservation of vision has been hitherto largely ignored." The work opens up further possibilities in the application of physiology to clinical medicine, but should be read in a spirit of open-minded inquiry rather than of blind faith.

STOURPORT MATERNITY HOSPITAL.—Mr. Neville Chamberlain has opened the extensions of the Lucy Baldwin Maternity Hospital at Stourport, comprising an antenatal department and an infant welfare centre.

MEDICINE AND THE LAW

Unsuccessful Claim against Doctor and Dentist

IN the joint actions of Warren *v.* Greig and Warren *v.* White on Feb. 1st Mr. Justice MacKinnon gave an important ruling, finding himself obliged to dismiss actions brought by a widow under the Fatal Accidents Act, 1846, against a physician and a dentist. Her husband, aged 36, was under treatment for lumbago and sciatica; his doctor, observing the presence of pyorrhœa and finding no other focus of infection, advised a dental examination with possible extraction of the teeth. A dentist was called in and, on their joint advice, the plaintiff consented to the extraction. This took place at the patient's house at 2 P.M.; the whole of his 28 teeth were extracted at one operation. The doctor himself administered the anæsthetic and the actual extractions occupied about 3 or 4 minutes; the patient was under the anæsthetic for 10 minutes altogether. The initial bleeding was heavy for 10 or 15 minutes. About 10 minutes later it was possible to prop the patient up in bed and morphia was administered. Oozing continued; the dentist began to plug the sockets, the patient being able to coöperate. The doctor had no hæmoplastin or other hæmostatic drug. He left the house at 3.10 and went to the nearest big chemist's; they had no supply but, by using their telephone, hæmoplastin was obtained from another firm and was sent to the doctor's house by 4.15; he at once took it to the patient's house. There he found that the plugs had been disturbed and that there was more bleeding than when he left. Eventually he became convinced that there was a hæmophilic tendency. The patient was removed to hospital at 5.55 where he died within 24 hours.

The allegations of negligence consisted of complaints that the extraction of 28 teeth at one sitting was a major operation not to be undertaken even with a healthy man. Dr. H. J. Van Praagh, giving evidence for the widow, said "it is in all cases negligent to remove 28 teeth at one sitting whether septic or not, and still more if they are septic." It was also said that it was unwise to operate in the patient's own home, or to leave the patient in charge of anyone but a qualified nurse. It was suggested too that the doctor should have anticipated copious bleeding and should have provided himself with hæmoplastin. Dr. Van Praagh said he understood the patient's spleen was found after death to weigh 16 oz. This was three times the normal size and could have been felt on examination during life. Such enlargement would lead to suspicion of myeloid leukæmia, an uncommon disease but one quite well known. There was a question whether a preliminary blood test should not have been taken. Dr. L. R. A. Wells, senior medical officer at St. Olave's Hospital, who made the post-mortem examination, said that microscopic slides taken from the spleen revealed acute leukæmia. A blood test would have revealed the condition; if the doctor had been told of recent nose bleeding, it would put him upon inquiry.

Mr. Justice MacKinnon said that, serious as a mass extraction was, apart from the inevitable pain and discomfort, he thought the patient, if in ordinary health, would not have died and would probably have been alive to-day in much better health. When a dentist was acting in conjunction with a doctor, it was no part of the dentist's duty to discover the general health of the patient or to search for abnormal conditions of the blood. If a dentist were acting alone he might be wise in some cases to demand medical advice. There was here no case of negligence against the dentist. As for the doctor, acute myeloid leukæmia was a rare disease and the symptoms were not very certain. The most important were enlargement of the spleen and excessive hæmorrhage from a wound. The real charge of negligence against the doctor, said the judge, was that he allowed the operation of extraction to be performed without a preliminary blood test. Mr. Justice MacKinnon held that the doctor could have failed to find the disease without having been negligent. He accepted the doctor's evidence that he had been given no previous history of nose bleeding. Having regard to the rarity of the disease, he was not satisfied that, before a serious operation, a blood test ought to be carried out as a safeguard against the bare possibility that the patient suffered from acute myeloid leukæmia. Thus, in his judgment, the widow failed to establish any cause of action against either dentist or doctor. The legal principle is important.

Unregistered Doctor and Death Certification

On Jan. 14th Frederick Clear Davidson, of Prudhams, Muncaster, was charged at York with using the title of doctor thereby implying that he was registered under the Medical Act. The chief constable said the accused had been visiting and treating sick persons. On his gate was "Dr. C. Davidson: hours 2 to 3 P.M.: 6 to 7 P.M. except Thursdays." Last November he called at the office of a registrar and obtained a book of 20 death certificate forms, representing himself as a doctor who had to certify the death of a patient. There was no suggestion of criminal negligence in the treatment of his patients, but the accused signed a certificate last November as "D. F. Davidson, M.B., Ch.B." When interviewed by a detective, he said the initials "D. F." were a mistake for "F. C." The bench dismissed the summons under the Medical Act but imposed the full penalty of £50 on a summons under the Perjury Act for making a false statement with intent to have it inserted in a register of deaths. The form which he filled up contained the usual printed words whereby the person who signs shows his "qualifications as registered by the Medical Council." The chief constable told the bench that Davidson came to York in 1933. Statements that he was connected with certain hospitals in London and York were totally untrue; he had in one instance given a vaccination certificate. When Davidson intervened with a denial that he had ever asserted any connexion with hospitals, the chief constable said he had witnesses who would say that the accused told them he was about to give an anæsthetic at the York City Hospital and that he had taken an active part in midwifery in London. It was stated by Davidson's solicitor (though not, apparently, by Davidson himself on oath) that he was in fact a bachelor of medicine and bachelor of surgery of the University of London. His possession of these degrees, it was suggested, put a different complexion upon the case inasmuch as they would have entitled him to registration had he cared to apply for it. The Medical Defence Union, which had brought the case to the notice of the York police, informs us that it has attempted in vain to verify Davidson's possession of the degrees which his solicitor claimed for him. The name of Frederick Clear Davidson, it seems, is quite unknown to the authorities of London University. When confronted with the claim to these degrees in the course of the proceedings before the magistrates at York, the police had no time to check the statement. They have doubtless done so since.

THE LANCET

LONDON: SATURDAY, FEBRUARY 9, 1935

CLINICAL SENSE AND CLINICAL SCIENCE

WHEREAS the possession of a "clinical sense" used to be the hall-mark of a wise physician, exciting emulation among students, the development of a "clinical science" is now much talked of as one of medicine's most urgent needs. No concise definition of either term could cover all its implications. Some would contend, unfairly, that the clinician richly endowed with clinical sense is one who, without searching investigation, habitually jumps to conclusions which afterwards prove to be right. The formality which once forbade easy approach of students to a chief on his rounds may have contributed to the idea that the bases of quick pronouncements at the bedside cannot profitably be analysed. Certainly many a physician risks a loss of prestige if he disregards the proverbial advice to give his judgment and withhold his reasons. That the reasons given in the course of a ward round are often rationalisations does not, however, falsify Dr. J. A. RYLE's contention [1] that the attribute known as clinical sense is no indefinable intuition or flair but a complex faculty based on accurate observation, precise retention, and apposite contrast and comparison of the observed phenomena of disease. The wise physician justly claims that in formulating a diagnosis or therapeutic judgment he is combining past experience and present evidence, and that elaborate investigation of the case under observation is unnecessary only because it has been undertaken in similar cases in the past. Unfortunately, from a variety of simple causes to which RYLE refers, the practising physician is by force of circumstances seldom able to select his patients, and is still more rarely able to subject his observations to critical review and to pursue their analysis with adequate concentration. He thus develops a faculty which cannot easily be taught; only masters of exposition like Prof. RICHARD CABOT (see p. 328) can manage to convey to medical science their gleanings from rich experience. The student who has followed his teacher round the wards from bed to bed may come to admire the exhibition of a clinical sense, the mental processes of which are as deeply hidden as the workings of an Abrams box. But on his first arrival at hospital, fresh from the dissecting-room and physiological laboratories, where he has been encouraged to believe nothing without good reason and to apply no label rather than one which may later have to be changed, he is often amazed at the atmosphere of the wards. Here he is told what to observe and how to observe it, but when he asks how to interpret his observations he may get an answer which seems to him empirical and arbitrary; or—and this he finds even more unsatisfactory—the interpretation offered may be based on a theory which he has been taught to regard as obsolete or invalid, or which is patently inapplicable to the human patient.

It is easy to find reasons why medicine should not be studied and taught in the analytical spirit appropriate to inorganic science, but it would be more profitable to explore other methods than the traditional one of attacking clinical problems. This has been done with brilliant success by Sir THOMAS LEWIS who has been chiefly responsible in this country for the growing popularity of the conception of clinical science. He has now attempted, in a book reviewed on another page, to illustrate the significance which he attaches to this term and to justify its use. The peculiar province of clinical science is to be work undertaken upon man himself—observation of the living patient, not that of some experimental substitute—and its aim is the understanding of human reactions to the actual disturbances of bodily well-being, not the reactions of isolated organs or of other animals to artificially produced changes. The field which the clinical scientist is to till has no boundaries, but he has a base for his operations, from which he sets out and to which he ultimately returns. Emphasis is laid by LEWIS upon the primary necessity of selecting a problem from the state of disease of a living patient, of conducting observations as far as is practicable on the patient himself at the bedside and of testing conclusions in the same way. He would require the investigator to preoccupy himself with problems concerning the origins of disease and its manifestations. Thus it is not so much by his material as by his method that the clinical scientist is to be distinguished. This method is that common to all science. The insistence upon the quest for knowledge for its own sake expresses LEWIS's view of that approach to the problems of medicine which distinguishes the clinical scientist from other workers on the same material—in particular, from the practising physician whose training and main occupation are directed towards gaining a "clinical sense" which is, for his particular job, as valuable as it is strictly personal. The aptitude for diagnosis in terms of special syndromes or diseases, and the flair for empirically successful treatment which he supposes to underlie the clinical sense of the practising physician are viewed by LEWIS perhaps with admiration, occasionally with tolerance, but always with mistrust. He claims that the phenomena of disease in man are open to study in themselves, just as are phenomena in any other field of inquiry, and that their interpretation can be made rigid and scientifically accurate without appeal to parallels in physiology. Concern with the restoration to health of the individual patient is to him incompatible with the attitude of mind essential to the scientific study of human disease.

This attitude of mind can, however, only be

[1] THE LANCET, 1934, ii., 1307.

preserved when the better endowment of clinical science makes it possible for picked men to escape the burden of practice and to devote themselves whole-heartedly to the study of their subject. LEWIS's efforts to make such escape possible for a larger number have been untiring and to some extent fruitful. But for the development of any field of work something more than opportunities are needed; men of ability and industry must be inspired to seize the opportunities that are being demanded for them, and no better source of inspiration could be imagined than the account of the results achieved by full-time workers in the clinical research department of University College Hospital.

TREATMENT OF STAPHYLOCOCCAL INFECTIONS

THE history of the last ten years in regard to the prophylaxis or treatment of streptococcal infections along immunological lines has tended to emphasise the difference between immunity to the invasive activities of a bacterium and to the toxin, or toxins, that it produces, and has suggested that the presence in the blood or tissue fluids of a relatively large amount of antitoxin has little if any effect in protecting the tissues against invasion by a highly virulent organism. Argument from analogy is, however, always dangerous; and it by no means follows that what is true of the streptococcus is true of the staphylococcus also. Two papers published in our present issue (and some others that have recently appeared) suggest quite clearly that it is not. The reports by D. S. MURRAY and C. E. DOLMAN on the results of clinical trials, in London and in Toronto, of staphylococcus toxoid in the treatment of recurrent or relapsing infections, such as furunculosis, acne, and carbuncles, are of more than ordinary interest both to medical practitioners and to academic immunologists. The former will examine the figures to form a judgment on the probable value of the new method of treatment as compared with those with which they are already familiar. The latter will value them for the data they contribute towards the solution of a perplexing problem, the effect of an antitoxic as opposed to an antibacterial immunity in an infection in which tissue invasion plays a significant part. The results recorded emphasise, also, the necessity, once animal experiment has indicated a line of advance, for carefully controlled trials in man; since, in this particular instance, it would seem that a more effective protection is attained against natural human infections than against experimental infection in the rabbit.

The significance of the data recorded by MURRAY emerges clearly from his tabulated figures. There is, of course, the old difficulty of establishing criteria of cure or improvement that are objective and capable of quantitative expression, and it cannot be said that the difficulty has been overcome; but it will probably be agreed that MURRAY, by adopting the rule of recording "recovery" only when he, the colleague who sent the case for treatment, and the patient treated were all agreed about it, has gone some way to ensure an objective and conservative estimate of his results. Assessed on this basis, the figures of his eighth table—51 cases recovered, 56 improved, and 9 unaffected, of 116 treated—are distinctly encouraging. It would be of great interest if the efficacy of staphylococcal toxoid could be compared, in parallel trials carried out on groups of adequate size, with that of other therapeutic methods that have obtained a considerable vogue, as, for instance, treatment with a staphylococcal vaccine or with yeast. Both MURRAY and DOLMAN refer to cases that had failed to respond to such treatment, but recovered when treated with the toxoid. Such scattered instances do not, however, afford any real basis for comparison; nor is it usually possible, by comparing reports on different methods of treatment, each of which is recorded as exerting a beneficial effect, to form any accurate judgment as to their relative merits. It is this question that actually exercises the mind of the clinician when faced with a patient whom he has to treat, and it is here that clear and authoritative guidance would be most helpful. For those whose interests lie in mechanisms rather than results MURRAY has an interesting story to tell. He shows, in agreement with many other workers who have examined this point, that most normal persons have some staphylococcal antitoxin in the blood—he gives a mean figure of 0·765 international units per c.cm. measured as antihæmolysin—and that this amount is not greatly altered in persons suffering from staphylococcal infections other than osteomyelitis. His mean figures for acne, blepharitis, furunculosis, and carbuncles range from 0·60 unit to 1·03 units, while seven cases of osteomyelitis gave a mean of 11·7 units. His fourth, fifth, and sixth tables show that an adequate course of toxoid injections induces a marked rise in antitoxin titre, up to eight or more times its original value; and the figures set out in his ninth table afford support for the view that the degree to which this titre is raised is correlated with the clinical effectiveness of the treatment. If any criticism is to be made of MURRAY's presentation of his figures, it is that the tabulation of the standard errors of his mean values would have made their significance more easily assessible, and would have conformed to a practice that should, we think, be universal in records of this type.

If, in this summary of the data set out in detail on other pages, we have quoted extensively from MURRAY's paper and not at all from DOLMAN's, it is because the latter presents his evidence in a form that makes useful quotation impossible and assessment of its significance difficult. His conclusions, however, are very similar to MURRAY's, and this agreement is obviously important, though he has made no serious attempt to provide the reader with data on which he can form his own judgment. Apart from the failure to present the data in a form that allows of statistical analysis, where such analysis is obviously necessary, there

is one suggestion in DOLMAN'S paper to which we should be inclined to take exception—namely, that staphylococcal toxoid should be prepared from several different strains of staphylococcus, and that failure to do this may account for clinically unsatisfactory results. There is, so far as we know, no evidence that such minor qualitative differences as exist between the toxins elaborated by different strains of staphylococci are of importance in relation to the prophylactic or curative value of the toxoids prepared from them; and the international unit of antitoxin, which now forms the basis for accurate quantitative work in this field, measures a particular activity of the toxin which appears to be highly correlated with its toxic potency for laboratory animals. If we are to progress in such studies as these we must adopt some working hypothesis that is in accord with the existing evidence, and adhere to it until the collection of new data affords reason for modification or addition. It is, of course, possible that toxic components other than those measured by the international unit are of importance in infection, but their existence and significance must be proved, not assumed. For the moment it is clearly desirable to approach the problem as MURRAY has done, by determining whether a toxoid that is known to be antitoxinogenic in terms of the international unit is an effective therapeutic agent in man, and whether there is a demonstrable relation between antitoxin production and clinical improvement. With another criticism applied by DOLMAN to reports of clinical failures—that no significance can be attached to such findings until it has been shown that the toxoid employed was possessed of adequate antigenic activity—we are, of course, in entire agreement. MURRAY'S paper is, as will be noted, a report to the Therapeutic Trials Committee of the Medical Research Council. He states that since his work was begun before the committee decided to make an official test of staphylococcal toxoid, his records do not conform exactly to those desired. They could, in fact, be improved in certain details. But they mark a very definite advance on the way in which evidence of this kind is frequently collected and presented; and if the Therapeutic Trials Committee are able to maintain and in some ways to improve this standard of trying out in the ward or the field methods devised in the laboratory, they will render a very real service to scientific medicine.

ST. GEORGE'S HOSPITAL

AT the end of last week the treasurers of St. George's Hospital, Lord GREVILLE and Lord WINCHILSEA, issued the statement that they were empowered by a unanimous vote of the board of governors to declare publicly that the work of rebuilding the hospital would start at once on the site that it had occupied for 200 years. The decision, which has thus been come to with no dissentient voice, had been forecast by most of those who knew the difficulties inherent in arriving at the best of three possibilities—to rebuild on the original site, to acquire and build on an adjacent site, or thirdly, to build in another district where the purchase of a suitable site would be less ruinously expensive. A communication from Sir GEORGE TURNER, the senior consulting surgeon on the staff of the hospital, was published in these columns on Dec. 22nd, in which the arguments pressing in one or other of these directions were set out, with the intention to indicate the difficulties before those who advocated the removal of the hospital. But the obvious fact that the hospital must be rebuilt was admitted, and this the treasurers confirm, pointing to crumbling and shored-up walls, and a lack of space that must cramp all advance, as complete justification for rebuilding. The statement of the treasurers of the hospital, which is published on p. 345 of this issue, will remove a public impression, which has long been current and which has worked possibly to the detriment of the institution. It has been held, despite protests and public announcements, that those in charge of the finances of the hospital have been sitting on a gold mine while allowing, under the eyes of all men, their buildings to fall to pieces. The proof is now before us that the conditions on which the site is held are such that a sale would leave only a small balance, if any, in favour of the hospital, after the purchase money had been employed in acquiring a site in the neighbourhood of Hyde Park Corner.

The determination to rebuild on the present site will be welcome to those who are, or who have been in the past, connected with the institution, but this natural sentiment is of no account compared with the public reaction. And it can hardly be doubted what that reaction will be. There are statistics estimating how many people pass St. George's Hospital daily in conveyances or on their feet. The figure is enormous, and a substantial proportion of those who pass must have recognised the drawbacks to the work of the hospital due to the state of affairs that has recently existed; yet many of them also know how splendid that work has been over two centuries, and, further, that in the face of grave material difficulties its quality has been maintained. Thus the decision which the authorities of the hospital have arrived at to remain and to rebuild should command general approval, and with that decision a period of intolerable doubt for the authorities comes to an end and there begins for them a struggle in hopeful circumstances towards complete rehabilitation.

We learn that a million pounds must be raised to rebuild, equip, and endow St. George's and the task will not be found a light one by those who are now preparing to undertake it. But public help can be safely anticipated. For some time past the hospital, in common with similar great charities, has been compelled to plead for help as a routine, and its outward appearance has given force to its appeals. But coöperation in a great constructive plan has never been present to the minds of donors, although they have given sporadically and frequently. They may have been made aware by the annual statements or by rumours of doings at the

hospital board, that a large sum was needed to place the hospital in a proper condition to carry on its valuable and ancient work, but how much money was wanted, and by what date, and in supplement of what existing resources, and in the furtherance of what particular policy has never been said clearly, though the information was obviously necessary to give urgency to any appeal. One recent donor, Dr. CHARLES SLATER, accompanied a magnificent donation of £10,000 with the definite statement that it was to form part of a new endowment. But he was behind the scenes; members of the public were not aware of the circumstances and have not followed suit. But now the facts are public property. The new St. George's Hospital will be endowed with 500 beds at £1000 per bed and a special Rebuilding Fund Committee has been formed to give effect to the procedure. The opportunity of the public is now. The sum wanted is a million, the date by which it is wanted is to-day, the site remains unchanged, and the object is complete rehabilitation. We intend to share the optimism of the DUKE OF KENT, president of the hospital, who, in an open letter realising the task before the authorities, says: "I feel sure that it will not be long before the new St. George's Hospital takes its place amongst the best equipped and most modern hospitals in the world."

ANNOTATIONS

DIABETES MELLITUS AND THE PITUITARY

THE importance of the observations by Minkowski and von Mehring on the effect of pancreatectomy on animals, and of the subsequent isolation of insulin need no emphasis. Somewhat paradoxically, however, these very advances tended to confirm the clinician in his gloomy opinion that diabetes is due to an irreversible exhaustion of the islands of Langerhans which is incapable of cure, in the strict sense of the term. The fact that the changes demonstrable post mortem in the pancreas, such as paucity of island tissue and of β granules, are inconstant, and in any case may mean nothing more than disuse atrophy, did little to dispel this gloom. Recently, however, a more cheerful view has been gaining ground, and it would need a bold man to assert to-day that diabetes mellitus is necessarily and essentially a pancreatic disorder. The evidence that the pituitary may be implicated in normal and pathological carbohydrate metabolism is detailed and discussed elsewhere in this issue by A. Lyall and J. A. Innes. It is established that the hormones of both lobes of the pituitary antagonise insulin to a considerable degree, so much so that, as Houssay has shown, an animal from which the pituitary has been removed tolerates pancreatectomy without developing any worse sign of diabetes than slight hyperglycæmia and moderate wasting. Such clinical evidence as is available accords on the whole with the experimental results. Thus in acromegaly, which is due to oversecretion of the anterior lobe, diabetes mellitus frequently appears in a form identical with the ordinary "pancreatic" variety except that it tends to regress in the later stages of the disease, when the functioning gland tissue is perhaps destroyed. A similar regression has been reported by A. M. W. Ellis [1] to follow removal of a pituitary tumour in a case of acromegaly. The influence of hypopituitarism on sugar metabolism is not so well defined, partly because the clinical characters of the condition are less surely founded, and partly because the increased sugar tolerance can be certainly demonstrated only by the continuous intravenous injection of glucose at carefully controlled rates—an extremely difficult test. It does seem, however, that sufferers from Fröhlich's and Simmonds's syndromes—the latter firmly, the former somewhat shakily based on hypopituarism—are able to deal with abnormal quantities of glucose without showing hyperglycæmia. On the other hand, in diabetes insipidus, which seems to be an expression of defective secretion of posterior pituitary hormone, or at any rate of its antidiuretic component, carbohydrate metabolism appears to be normal. A great deal more information will clearly be needed before the mosaic is complete. Meanwhile the case recorded by Drs. Lyall and Innes is instructive and suggests that routine examination of the pituitary would be worth while in diabetic patients. When their patient was first seen he appeared to be suffering from severe but otherwise ordinary diabetes. Later on the symptoms improved to such an extent that insulin was no longer needed. Such an improvement is sufficiently unusual to attract attention, for ten years' experience of insulin suggests that once diabetes has been brought under control, while temporary increases in the dosage of insulin may be required from time to time, it is rarely possible to reduce the dose without causing glycosuria. Lyall and Innes found what they believe to be the cause of the remission of the diabetes in the shape of a shadow in the pituitary fossa which was not present in earlier X rays. They suggest that this shadow is caused by a calcified tumour which is destroying the pituitary and thus removing the antagonistic effect of its hormones. No sign of acromegaly is manifest. If the clinical signs of Simmonds's syndrome should later make their appearance in this case, the authors' suggested explanation would be considerably strengthened. Fortunately for himself, however, the patient remains in good health.

[1] THE LANCET, 1924, i., 1200.

THE SALE OF DRUGS IN AMERICA

THE Federal Food and Drug Administration in the United States of America examined last year 54,000 samples of food and drugs and found an alarming proportion of them adulterated or misbranded. More than a thousand criminal prosecutions were recommended by the bureau, about a quarter of them on account of false therapeutic claims for medicinal preparations. It is interesting to note that in the United States fresh legislation about drugs is demanded by the American Medical Association. Its Council on Pharmacy and Chemistry asks in particular that the Government should officially announce, from time to time, a list of the drugs which are habit-forming, and that, except under direction of a physician, no habit-forming drugs may be sold, whether singly or in mixtures, unless the labels and advertisements contain a suitable warning of their effect. The Council also advocates that no mention of a disease be made on the labels or advertisements of drugs unless the drug or preparation is actually a cure for the disease named or unless it is a palliative and the nature of the palliative

effect is stated. The Association finds fresh problems in the modern developments of advertising foods and drugs by wireless or otherwise in America. Its Council proposes that legislation should require all advertisements of drugs to be truthful and not deceptive by implication. The responsibility, it is suggested, should be placed on the person or company issuing the advertisement except where the person or company produces a guarantee of truth from a guarantor who is amenable to penalties. Another proposal concerns a matter which the English law leaves in some doubt. The American Council would prohibit the sale of drugs or preparations under names recognised in any official compendium unless they comply with the standards and specifications laid down in the compendium. As was noted lately in our columns in connexion with a London prosecution for the sale of iodine ointment under the Food and Drugs (Adulteration) Act, the standard of the British Pharmacopœia is not absolutely conclusive in our courts. Conversely, where mixed drug products are not listed in an official compendium, the reformers of the American law are asking that all the active ingredients should be disclosed, with the amounts and proportions, on labels and advertisements. They further demand heavier statutory penalties and a stipulation that all labels should bear the name and address of the manufacturer and particulars of net weight or volume. Finally, we may note a proposal that all testimonials and opinions used in advertising drugs should be accompanied by the writers' names and should be considered as statements for the truth of which the advertisers are responsible. Human nature being what it is, at any rate on this side of the Atlantic, one might add that the public has also a right to know whether the testimonial was really an unsolicited and disinterested statement or no and, in the latter alternative, the exact amount of the solicitation or interest.

LIVER TREATMENT IN SUBACUTE COMBINED DEGENERATION OF THE CORD

Two groups of American investigators have recently discussed the effects of treatment with liver on the neurological signs and symptoms in Addisonian pernicious anæmia. S. M. Goldhamer and his colleagues, investigating 461 cases of pernicious anæmia, noted clinical evidence of spinal cord changes in 89·2 per cent. of the cases and cerebral symptoms in 64 per cent.[1] Regardless of the type of therapy given, they conclude that improvement in symptoms was observed in less than 50 per cent. of cases and improvement in signs in about 2 per cent. Anti-anæmic therapy, they therefore believe, has no specific curative effect on spinal cord degeneration, but contributes, only indirectly, by increasing muscular power, to the improvement in the manifestations of central nervous system lesions. R. R. Grinker and E. Kandel[2] arrive at no less gloomy conclusions, stating categorically that "liver therapy is not efficacious in improving or preventing degeneration in the central nervous system." Such improvement as may be observed, they believe, is due to loss of the anæmia. The cerebral symptoms, for instance, they hold to be entirely due to the anæmia, and these are relieved by liver therapy. Likewise, perhaps without adequate evidence, they claim that the peripheral nerve complications, consisting of dys-æsthesia, atrophic changes in the skin, and perhaps other dissociated sensory defects, are alleviated by cure of the anæmia. Finally they suggest that it is useless to give larger quantities of liver than that necessary to maintain what they believe to be a normal blood count. These workers attribute the more optimistic conclusions regarding the value of liver therapy in subacute combined disease previously published to the fact that the observations were not made by the same trained neurologist observing the same patient over a long period. It would appear, however, that the neurological prognosis now offered is unnecessarily pessimistic. Goldhamer and his colleagues accept the surprisingly low figure of 4,000,000 red cells per c.mm. as evidence of adequate treatment. In the patients described in detail by Grinker and Kandel only three had a red cell count of over 5,000,000 per c.mm., and two of these, as they themselves admit, showed definite improvement. In many of the other cases the count was under 4,000,000 per c.mm., and the lack of improvement in the central nervous symptoms is therefore not astonishing. It has repeatedly been emphasised by many workers that unless the red cell count is maintained at over 5,000,000 per c.mm. improvement in the nervous symptoms is not to be looked for. Unless this level is reached it is not justifiable to claim that liver therapy is without effect, in opposition to the findings of many competent observers, among others Baker, Bordley, and Longcope in America,[3] and Ungley and Suzman in this country.[4]

[1] Jour. Amer. Med. Assoc., 1934, ciii., 1663.
[2] Arch. Int. Med., 1934, liv., 851.
[3] Amer. Jour. Med. Sci., 1932, clxxxiv., 1.
[4] Brain, 1929, lii., 271.

INDUSTRY AND OCCUPATION

In addition to the statistics of housing in England and Wales, which are naturally attracting considerable attention at the present moment, the Registrar-General has now issued four volumes of the 1931 census. In these are set out in much detail the occupations and industries in which the population of England and Wales are engaged.[5] The distinction between the industrial and the occupational classification is not always fully grasped, but it is an important one and fully justifies the very heavy labour of tabulation that the production of these volumes demands. It is the *occupation*, the kind of work a person performs, that determines the particular physiological or psychological hazards or strains to which the individual is exposed, and the general conditions under which his daily work is carried out. The *industry* in which he is found is from this point of view—that of occupational mortality or morbidity—largely immaterial. Hence a satisfactory occupational classification ignores the irrelevant consideration of industry, and groups together, for example, all clerks whether they are employed in insurance, trade or transport, &c. The importance of this division by occupation was well brought out in the last of the Registrar-General's reports on occupational mortality.[6] In all previous reports, dating back to 1851, the calculation of death-rates was based upon the industrial classification, so that the records of an unhealthy occupation were diluted by the inclusion of other workers, industrially related but not subject to the same specific occupational risk, and the mortality experienced thus understated. An instance of the effect of the change to an occupational basis, which the Registrar-General quotes in his introduction to the 1921–23 report, is the case of cutlery grinders. In the earlier reports these workers, who

[5] Occupation Tables, £1 10*s*. Classification of Occupations, 12*s*. Industry Tables, £1 12*s*. 6*d*. Classification of Industries, 4*s*. 6*d*. 1931, Census of England and Wales. 1933 and 1934.
[6] The Registrar-General's Decennial Supplement. 1921. Part II.

are exposed to a special silica risk, were grouped with all others employed in the manufacture of cutlery, many of whom ran no special risk. This composite group had in 1910–12 a mortality-rate 63 per cent. above the average. In 1921–23 figures were available for men classed occupationally as metal grinders and their excess mortality was found to be no less than 230 per cent. Such results were, in the Registrar-General's phrase, "a new revelation of occupational risk," and quite apart from such sensational examples the occupational classification invariably shows far more clearly than the industrial the particular groups of workers for whom special danger to life exists. Upon the occupational statistics of 1931, issued last year, the occupational mortality-rates of 1930–32 will be based, and workers in public and industrial health will await the report with interest. From the economic point of view, on the other hand, the tabulation by industry is of very great importance. It affords a clear record of industrial development, of the expansion or contraction of particular forms of national activity, their local concentration and movements both in space and time. For example, the 1931 census figures show that for every 10,000 occupied males there were 724 employed in agriculture compared with 857 in 1921 and 991 in 1911. The records of the last census also enable a division by industrial status to be made, so that, for males and females separately, it can be seen how many belonged to the managerial class, how many were operatives, how many were stated to be working on their own account, and how many at the date of the census were out of work. Between them these volumes provide an immense store of information on the employment of our population.

AFTER-TREATMENT OF RADICAL MASTOID OPERATIONS

FOR the cure of acute mastoiditis, the Schwartze operation, also called the cortical mastoid operation or antrotomy, is a very satisfactory surgical procedure, the normal end-result of which is a soundly healed tympanum with an intact membrane and usually unimpaired or, at least, very good hearing. In contradistinction to this, the radical mastoid, or Stacke, operation, which is performed for the treatment of chronic mastoiditis, has many drawbacks and is now reserved for those cases in which the disease endangers life or health. By this operation the remnants of the tympanic contents are removed together with the posterior wall of the meatus; the attic is opened up by removal of its outer bony wall, and the tympanum, attic, antrum, and mastoid cells are thrown into one cavity. The effect on the hearing is always uncertain and often bad, though it must be remembered that usually the disease has already caused considerable impairment. To meet this drawback the membrane, ossicles, and tympanic ring may be left undisturbed which, in successful cases, gives a better prospect of useful hearing; this conservative operation is particularly indicated in children and when the operated ear has better hearing than its fellow, but it is useless when there is caries of the ossicles or marked disease in the attic.

The objective of the radical mastoid operation is to obtain a smooth dry cavity in the bone lined by squamous epithelium, and open to the air through the external auditory meatus. This result is often difficult to achieve; one of the most important troubles encountered is the presence of exuberant granulations which delay healing and produce fibrosis thus causing irregular contraction of the cavity; another is the persistence of a moist surface due to remains of mucous membrane or, most often, to a patent Eustachian tube up which mucus can pass and from which mucous membrane can grow into the tympanum. Even after healing has taken place, attention is necessary at regular intervals, for this is a deeply placed cavity insecurely lined by squamous epithelium which sheds its outer layers continually; if the debris be not removed, it becomes macerated and causes a recurrence of suppuration.

That the details of after-treatment vary greatly in the hands of different otologists emerged from a discussion by the otological section of the Royal Society of Medicine on Feb. 1st. Mr. H. V. Forster opened with a summary of the problems concerned, beginning with the treatment of the soft external meatus, whether it should be split, a plastic flap cut, or whether it should be simply left alone. The question of packing was considered, with dry gauze, with a gauze-filled glove-finger, or with gauze impregnated with B.I.P.P., with bismuth cream, or with ichthyol and glycerine; and whether packing is advisable after the first dressing or not at all. Mr. A. J. M. Wright advocated a first packing with a strip of oil-silk and thereafter exposure of the cavity to the air. The vexed question of skin-grafting also received attention; Mr. C. Gill-Carey favoured a primary graft, while the president, Mr. E. A. Peters, advised grafting the larger cavities only. Mr. H. A. Kisch described his method of filling the mastoid cavity by a flap from the temporal muscle. No meatal plastic is required; the incus is always removed, the malleus sometimes. He claimed 68 per cent. dry after five years, and 67·5 per cent. with improved hearing. The discussion naturally did not reach finality, but was helpful, especially through the insistence on the importance of a painstaking eradication of all disease and of all pockets at the operation, of meticulous care during the after-treatment, and of regular inspection when healing is complete. By these means only can good results be obtained.

CATGUT ALLERGY

THE advantages of catgut as a surgical suture material are so real that it is adopted by most surgeons for the major part of their work. Indeed many use no other when stitches or ligatures must be retained in the body, though a few surgeons remain faithful to silk or linen thread. The controversy which has ranged round the relative merits of these different materials has centred chiefly upon their absorbability or permanence and the facility with which they can be sterilised; little attention has been directed to the reactions which they call forth in the tissues of the body. The results of experiment and observation in this respect are equivocal. Some writers, particularly those who have followed the clinical effects in humans, affirm that silk produces less reaction than catgut, whilst others, especially those basing their statements upon animal experiments, make the contrary assertion with no less emphasis. The use of catgut certainly implies the introduction of foreign protein into the organism, a procedure which might well, in certain circumstances, give rise to a considerable reaction. Three years ago Oscar Gilson and André Gratia[1] reported some interesting work on the effect of introducing short lengths of catgut into the peritoneal cavity of guinea-pigs and rabbits. They found little reaction unless the animals had previously been injected with horse serum; if they

[1] Comptes rendus des séances de la société de biologie, 1932, cxi., 1081.

had, a plastic peritonitis was set up which led to matting of the intestines. This effect they regarded as an allergic reaction, and made the interesting observation that they could not produce these results in a rabbit which had previously refused to exhibit allergic reaction. They made the further suggestion that the formation of adhesions in the abdomen after operations may on occasion result from such reactions. There seems no good reason why injection with horse serum should make an animal sensitive to sheep protein. Among men, of course, some are sheep sensitive, a larger number horse sensitive, and others may be made horse sensitive by a previous injection of a therapeutic serum. In sensitive persons the use of catgut within the abdomen might well lead to the formation of adhesions. Recently W. Wayne Babcock [2] has observed, in humans, the difference in the reaction of the skin to silk and catgut. Around a catgut stitch there is a distinct tissue reaction, leading to necrosis, which is absent with silk. Babcock believes the allergic catgut reaction to be particularly pronounced in thyroid operations. Since he has given up the use of catgut he declares that his wounds heal with a less perceptible scar and that there is an absence of that blood-stained watery secretion which so commonly flows from the drainage-tube after thyroidectomy. He claims to have been able to discard the use of a drainage-tube since he has adopted the silk technique. In his hands the substance which produces the least reaction of any is stainless steel wire and he recommends its use wherever possible. It is clear that the ideal suture material has yet to be discovered. Catgut is far from ideal, but with all its disadvantages, most surgeons would agree that it remains to-day the most useful and most suitable material for general work.

CARRIERS OF THE MENINGOCOCCUS

THE problem of the carrier, his significance, and what to do with him when he is detected, is one of considerable administrative importance, and any fresh light thrown upon it is of interest to all those whose task it is to guard the health of the civilian population or of the fighting services. The light thrown on a particular problem of this kind, that of the meningococcal carrier, by a paper recently published by S. F. Dudley and J. R. Brennan,[3] is somewhat disturbing. During the 15 months ending in March, 1933, 11 cases of cerebro-spinal fever occurred among the services stationed at Chatham. Of these only one died, so that the case-mortality was unusually low. During the greater part of the period over which these cases were occurring the carrier-rate remained relatively low—between March, 1932, and February, 1933, it varied between 9·4 and 14·3 per cent. Concurrently with the incidence of the tenth case it rose to 20 per cent., and in March, 1933, when the eleventh and last case occurred, it rose sharply to 61·6 per cent. Thereafter no case was reported during the period (March, 1933, to May, 1934) with which the report is concerned; but the carrier-rate among service ratings and ranks—i.e., among random samples of non-contacts—remained obstinately high. Ten samples of men were examined, the number in each sample varying between 35 and 50, and the carrier-rate varied from 30 to 66 per cent., with a mean value of 54 per cent., and a standard error of ±2·3 per cent. As a contrast to this surprisingly high rate, persisting over a period of 15 months during which no cases of cerebro-spinal fever were reported, the authors quote figures obtained at Portsmouth during the same period, when the admission of six cases of cerebro-spinal fever to the R.N. Hospital was associated with a carrier-rate of 5·1 ± 1·7 per cent. among 177 contacts. The significance of such findings as these seem unmistakable. A very high carrier-rate may persist in the entire absence of any overt cases of the disease. The incidence of such cases may, on the other hand, be associated with a low carrier-rate. The determination of the carrier-rate among a given population thus gives no automatic indication of the probability of the occurrence of cases. It seems altogether probable, as Dudley and Brennan suggest, that the curious events at Chatham were due to the distribution, among the population at risk, of a strain of meningococcus that had considerable powers of vegetation in the human nasopharynx, but very little power of producing the disease in its characteristic clinical form. It would seem that the case: carrier ratio over any particular period, or in any given group of the general population, depends in large part on the biological characters of the particular strain of meningococcus that is dispersed among them. Incidentally the Chatham experience affords another, and a very striking, example of the futility of any attempt to segregate meningococcal carriers—a 60 per cent. non-contact carrier-rate would present an impossible administrative problem even if there were any reason for believing such segregation to be necessary or desirable. The Chatham experience also affords data on the relation of density of population, especially in sleeping quarters, to the spread of nasopharyngeal infection. No correlation was found. The most senior ratings at Chatham, those with the most spacious accommodation, had as high a carrier-rate (60 per cent.) as the recruits, who had the worst sleeping quarters. Those of the intermediate seniority, with intermediate accommodation, had a significantly lower rate (38 per cent.).

[2] Amer. Jour. Surg., 1935, xxvii., 67.
[3] Jour. Hyg., 1935, xxxiv., 525.

DIGITALIS AND QUINIDINE

THE practice of haphazard or routine administration of digitalis in the absence of heart failure is roundly condemned in a recent address by Prof. P. Morawitz of Leipzig.[1] The doctrine that digitalis should be ordered on principle as a cardiac tonic for all old patients presenting symptoms of heart disease has been upheld in many quarters. Some doctors go so far as to prescribe it as a routine before any operation in elderly patients, irrespective of the presence or absence of heart symptoms. Morawitz emphasises the need for individual attention to every patient when this powerful drug is being considered, and sees few indications for its use except heart failure itself. As he points out, digitalis has its dangers in diseases of the conducting bundle and in coronary artery disease; he would limit its exhibition—in the absence of heart failure—to those forms of arrythmia which are associated with a rapid pulse, and would avoid it altogether for patients showing extrasystoles. In the tachycardia and arrythmia of Graves's disease he has found it of little value. When decompensation is present, however, he sees no contra-indication to its use, whatever the type of arrythmia. Morawitz believes quinine, or its isomer quinidine, to be of value in a much wider group of cases. He designates quinine the "digitalis of disorders of rhythm," and regards small continued doses of quinidine as a measure preventive of cardiac disorders, such as paroxysmal fibrillation, extrasystoles, and even of sudden death in angina pectoris;

[1] Deut. med. Woch., 1935, lxi., 1.

as well as of simple paroxysmal tachycardia. In the treatment of auricular fibrillation the consecutive use of digitalis and quinidine will probably restore a normal rhythm in from one-sixth to one-third of the cases, but here again Morawitz offers two timely warnings: First, that a number of patients who revert to normal rhythm under this treatment are worse off clinically than they were before—in other words, the heart becomes less efficient than when fibrillating. He advises therefore that attempts to restore regular rhythm should only be made when the fibrillation is actually causing symptoms. Secondly, even apart from the danger of producing heart-block or emboli, the success of any attempt to produce normal rhythm seldom persists for long.

A NEW BUNSEN BURNER

IT is so many years since Robert Bunsen invented his burner that his name is now usually written with a small "b." Of its few variants one due to Castell-Evans enabled the flame to be turned very low without burning back; others due to Teclu and Méker gave a hotter and more homogeneous flame than could be obtained from the ordinary form with its long cone of unburnt gas. A new burner has now been designed by Amal Ltd. (Birmingham) which will give (1) as small a flame as an Argand for evaporations and gentle charring, e.g., of vegetable materials which are to be ashed, (2) a compact hot flame which is perfectly stable, with the unburnt zone confined to the base of the flame, as in the Méker, but which does not burn back, or (3) a large flame with single cone of unburnt gases for boiling or distillation in large vessels. This burner is provided with a needle valve to control the consumption of gas and a Venturi tube through which the gas streams and mixes with the correct volume of air; even when the valve is nearly closed the mixture of gases does not stream so slowly that the flame travels downwards. The area of ignition is formed by a block at the top of the tube, pierced with a number of circular holes and as in the Méker the gas-air mixture, already well preheated in this region, burns in a cluster of united bunsen flames. The burner is made of heavy metal, well plated with chromium, and a test in a busy laboratory for a few weeks has shown that it possesses many advantages over the more usual forms. The illustration shows the burner taken apart, with the milled head controlling the needle valve on the right and over the gas entry tube on the left a useful handle which enables the burner to be moved or lifted when it is hot.

PSYCHIATRY IN RUSSIA

No one with even limited powers of viewing a communist experiment objectively could approach a book entitled "Soviet Russia Fights Neurosis"[1] without some degree of intellectual excitement. Many will read it through without feeling defrauded, for it is written with vigour and in entertaining style. From the point of view of psychiatry, however, it is disappointing. The fervour of Russian youth is fully appreciated and described, and the effort that the Soviet Government is making to combat mental disorder is welcomed with the enthusiasm of a not too critical partisan. Though the author is himself a psychiatrist, he has ignored psychiatric problems in his impatience with the shortcomings of our social order. While we learn much about the general philosophy of communism and its attitude to youth, we are still left in the dark as to what psychiatry really means in Russia. It seems as if psychiatric opinion there is governed entirely by politics. While many will agree that profound economic changes in society might well eliminate the precipitating factors of mental disorder, few would contend that the deep motives of the mind, the disturbances of which produce such disorders, have been clearly faced by Russian psychiatrists. Dr. Williams has written a significant chapter on hate, but he appears hardly to have understood the mechanisms of hate and guilt which modern psychopathology has attempted to disclose. The work has been put together on the supposition that an economic policy alone will reshape not only society but the psychology of individuals. It is clear that economic justice wherever it is produced, and by whatever means, may eliminate many of the precipitating factors of mental illness. But Dr. Williams, it would seem, has failed to see how the communist society has redirected hatred, and that though it has produced something in the nature of a mass mental change this is not necessarily a mass mental cure. While authoritarianism reigns in Russia, "liquidation" has been only the production of conversion neurosis in a new guise.

NUTRITION IN BRIEF

PRACTITIONERS who are asked for advice about the kind of food the housewife should buy, and the reasons why she should buy it, will find it helpful to give the inquirer a pamphlet just produced by the Committee Against Malnutrition. At the price of a penny it describes in the most elementary language the findings of nutritional science as applied to every-day life. Such plainness is unusual in attempts at health education, and the authors are to be congratulated on making all their arguments intelligible and avoiding every technical term. Their first sentence reads, "Food is a simple matter to understand," and their outline justifies this introduction. Sir Gowland Hopkins, P.R.S., in a foreword says: "This pamphlet contains simple truths very clearly stated. I trust that those to whom it appeals will read it with sympathy and belief." It is intended primarily for use in Women's Institutes but it deserves even wider recognition. The address of the committee, whose secretary is Mr. F. Le Gros Clark, is 19C, Eagle-street, London, W.C. 1.

Dr. Robert Henry Micks, physician to Sir Patrick Dun's Hospital, Dublin, has been elected professor of materia medica and pharmacology in the school of the Royal College of Surgeons in Ireland.

[1] Soviet Russia Fights Neurosis. By Frankwood E. Williams, M.D. London: George Routledge and Sons. 1934. Pp. 251. 7s. 6d.

PROGNOSIS

A Series of Signed Articles contributed by invitation

XXXIX.—PROGNOSIS IN SCHIZOPHRENIA

IT is difficult to speak of the prognosis in schizophrenia without referring to the extraordinary change in the conception of this disorder. Thirty years ago it was regarded as a disease of young people, with an outcome always disastrous; the ultimate dementia was a touchstone of correct diagnosis, and the name "dementia præcox" betokened the hopeless outlook, as well as the early onset. But clinical study of the symptoms enforced a wider notion of this disorder, which now, under a less significant name, rests on a descriptive psychological basis. By "schizophrenia" one means groups of symptoms in which certain disturbances of function are evident. A biological unity among these groups has not yet been demonstrable, nor a single common factor in causation, though there are reasons for assuming both; further study may result at least in better-based and more useful groupings. But as schizophrenia is to-day, there is no common cause and no common outcome to the disorder. Certain common features there are in all its manifestations; a constitutional basis, moreover, may very often be found, and in a majority of cases the apparent effect of the illness upon subsequent life is harmful, though the minority to whom this does not apply is considerable. Also, where the illness does leave its mark, the kind, degree, and persistence of the damage vary greatly in patients whose attacks seemed otherwise similar. Clearly prognosis here is an unusually difficult problem, hardly to be solved by simple rules. It is an added difficulty in arriving at rules at all, that the course of the illness must be observed over a lifetime, not merely for a year or two after an attack, if one is to discover prognostic criteria, and that the grounds for diagnosis have changed during the course of this century; they have not yet reached stability or concreteness, though there is probably now a common consent in usage of them by most expert psychiatrists. As to statistics, there are plenty; they speak with divided voice and are as yet of little value for individual prognosis.

Schizophrenia may be regarded, for diagnosis and other clinical purposes, as a form of maladaptation in which there are certain characteristic defects of inner harmony and consistency in behaviour, thought, and emotion. These are rarely seen in childhood, but from puberty onwards they may appear in varied combinations (often in persons who have been for years introspective and unsociable). There is discrepancy between mood and utterance, disturbance of conduct (briefly summed up as catatonic or hebephrenic), self-absorption, and incapacity for sustained thinking along normal lines. A guarded or artificial demeanour may conceal these essential features, whereas they may be conspicuous in a florid or "deteriorated" case. Hallucinations and delusions may fill out the picture; affective or other morbid types of reaction may complicate it.

Before considering the points that are helpful in assessing the outlook for an individual patient, it must be emphasised that schizophrenia is always a serious condition. Though some recover, the tendency of this morbid change is to do permanent damage to psychic life. Statistics showing a majority of recoveries from the condition rest on unorthodox diagnosis, superficial inquiry, or insufficiently prolonged periods of later observation. In the individual case, however, pessimism may not be justified. The most relevant details bearing on this will be those of heredity and constitution, mode of onset, environmental factor in causation, duration of symptoms, treatment, and, last and perhaps least, symptomatology.

HEREDITY

To heredity, as indicated by the occurrence of schizophrenia or related oddities of personality in the family, limited importance must be attached. Where one parent is schizophrenic, and the other has schizophrenic relatives, or where an identical twin of the patient has for some years been suffering from a severe schizophrenic illness, or where there is a large number of siblings or collaterals with severe progressive schizophrenia, then (though less reliably in the last case given) the outlook for a good recovery from an attack in the affected person is poorer than where his pedigree shows no evidence of schizophrenic propensity, or where there are less ominous strains—e.g., affective psychoses—among his antecedents. Apart, however, from the indications afforded in rare instances by two affected parents, or by an affected uniovular twin, hereditary guides to prognosis are dubious; in no instances can one prognosticate with certainty from them regarding the present attack.

CONSTITUTION

Constitution, however (seen as the product of interplay between hereditary and environmental influences, acting especially during the most plastic period of development), is of great assistance in judging the probable outcome from a disorder which can itself so profitably be regarded as a manifestation of constitutional failure to achieve adaptation to the requirements of daily life. If a patient's physique is of the pyknic type, commonly found among manic or depressive patients as also among the more affectively labile people in the normal population, then, though his illness be undoubtedly schizophrenic, the outlook is better than where he has weedy asthenic physique or shows dysplastic features in his bodily habit. Not that these types of physique can usually be determined with certainty, but approximations to them can generally be recognised by inspection and measurement.

The less physical aspects of constitution must here also be considered. In the patient's previous personality tendencies may be recognised which pointed not only to the outbreak of the illness but also to its persistence and extent. It cannot be denied that there is no constant type of personality among those affected with schizophrenia, but some types are more frequent and more ill-omened. The patient who has for years tended more and more to withdraw from his surroundings, to be careless of social requirements, to lie late and live alone, given up to day-dreaming and eccentricity—such a patient, should he become schizophrenic, has a poorer outlook than the active, suspicious, impulsive man or the self-conscious, introspective worrier who similarly falls ill. Where the personality has shown wide interests and possibilities there is less likelihood of deterioration than where it is narrow and rigid. It would be saying too much to claim that by a retrospective study of the previous personality in its changing responses and development the psychosis can be understood entirely as an inevitable reaction to the demands on the patient, or that with the fullest

attainable knowledge concerning the personality one can always see why the illness followed a downward course or was arrested rather than cured. But in many cases one can arrive at a partial understanding along these lines and forecast with more probability what will come of the illness. The personality from childhood onwards is so complex in its interaction with the environment that a full understanding is still far to seek. Even partial understanding nevertheless is helpful; and not only so because of its hints as to the forces engaged, their strength and direction, but also because it enables the psychiatrist to disentangle somewhat the body and form of the disorder from its clothes and trimmings, so to speak. The need for such disentanglement is clear where there has been, for example, an unusual cultural milieu such as a spiritualist household, or where several types of reaction are in evidence—e.g., hysterical as well as schizophrenic. It is, moreover, important to recognise that what seemed perhaps a schizoid personality, showing itself more clearly as the years went on prior to the definite outbreak of illness, may have been a quiet and insidious schizophrenia, a more ominous affair. This distinction may be made, without prejudice to the issue of whether there is a difference only of degree or of kind between schizophrenia and schizoid types of personality. The more the personality has shaded indefinably into the illness, the greater the threat to subsequent mental health, other things being equal.

MODE AND AGE OF ONSET

The mode of onset is of considerable importance. Where it is abrupt and stormy, the prognosis is much better than where the beginning of the morbid symptoms is hard to fix and there has been so gradual and unobtrusive a change that the relatives have scarcely recognised it as illness at all. Related to this is the significance of environmental factors. Where the onset has followed upon a recent painful experience and the content of the patient's talk and his behaviour have reference to this, or where a structural or toxic disturbance appears to have provoked the symptoms, as after a cerebral trauma or alcoholism, the outlook is generally better than where the provoking factors are quite obscure. But this rule has only limited validity; sometimes after such a beginning the illness, however relevant its content, seems to become autonomous and progressive, irrespective of what is done about its earlier excitants. If the attack of schizophrenia occurs during puberty or adolescence, prognosis must be cautious, because on the one hand the apparent schizophrenia may be a relatively harmless and normal phenomenon of the difficult period of adolescent adjustment, and on the other hand it is in patients between the ages of 16 and 25 that the most fatal and progressive form of the disorder is usually found. Much will depend on an assessment of the personality as well as intimate knowledge of the emotional and physical changes that the patient is struggling with, and of his symptoms in their relation to his psychobiological problems. Schizophrenia in still younger children is sometimes mistaken for mental deficiency; the outcome is bad, in some taking a form almost indistinguishable from deficiency, in others showing one of the familiar schizophrenic pictures. No material is available to indicate whether any of these cases in children clear up completely and for good. Correct diagnosis is important but may be very difficult. The less understandable the apparently psychotic behaviour in the child the worse the outlook, on the whole.

NATURE AND DURATION OF SYMPTOMS

The nature of the symptoms is a very poor guide to their sequel. Extreme departures from normality are of small consequence in prognosis. Simplicistic inferences about "regression" give no help. What is outwardly the mildest illness may be the most ill-boded. It is almost true to say that the only important symptoms in this regard are those which indicate that the illness has already been present a long while, and that behaviour and modes of thought and affective response are narrowed and more or less fixed. Habits and somewhat automatic behaviour of this sort may be seen in the stereotypies of movement and speech. Hebephrenic patients, or those in a long drawn-out stupor with negativism, impulsive violence, muscular tension, and vasomotor changes, generally do badly. Where many manic or depressive features are present, the prognosis may be regarded as better than otherwise. If the patient has had three or more previous attacks and has been well in the intervals, the outlook may be taken as good. If he first falls ill in middle life he will scarcely go downhill in the tragic way young people sometimes do; he may develop fixed delusions which are often rigid and encapsulated, so to speak; he may therefore be able to return to ordinary life, with reservations, or it may be that these morbid beliefs absorb all his mental powers and compel institutional life. It will sometimes be possible by study of the maturity and health of his previous personality to judge how he will dispose of his present morbid ways of life. One will be greatly influenced by one's discovery of much survival of healthy modes of response in the illness itself.

INFLUENCE OF TREATMENT

The influence of treatment on the outcome is important. No man is entitled at present to express anything more than hopes concerning the power of treatment at any age to avert a threatened schizophrenic illness; no one can tell when or whether a schizophrenic illness is going to occur in a particular patient who is as yet free from symptoms, and pretensions on this score are empty, not to say ignorant. Only in rare instances where the hereditary conditions and environmental factors are unusually clear can one do more than offer a statement of statistical probability on this point—a statement necessarily insusceptible of application in any confident way to the prediction of an individual fate.

But, apart from any empty claims, it is undeniable that when the illness has shown itself, in however subtle and inconspicuous or gross and dramatic a guise, much may be done by skilled treatment to alter its form, to shorten it, to avert a wholly evil outcome, and to mitigate the damage, sometimes even to bring about total restitution to health, so far as one can tell. While in our present state of knowledge prophylaxis is still a matter of assumptions and possibilities, the efficacy of treatment is constantly being confirmed by clinical evidence. Such treatment will pay less regard to the content of the morbid changes and their relation to previous experience than to the averting of any fixation of habits along lines of unsatisfactory adaptation. It will be concerned with the early restoration of social demands and with promoting the best possible response to these. Treatment aims at cutting short the attack and then, in the broadest way, using every means of getting the patient back into ordinary society on tolerable terms. The effect of treatment

must be judged by social rather than formal psychiatric criteria. There are so many ways in which a schizophrenic illness may turn out. The attack may be followed by a condition in which none of the recognised clinical features of schizophrenia are present, yet the patient does not return to work, his interests are perhaps a little narrower than before, he shows less spontaneity, he is more easily tired, he may be hypochondriac or show other symptoms thought to be "neurotic." Such a patient may in some circumstances justifiably be regarded as having made a poorer recovery than another who has returned to ordinary life, though careful inquiry reveals definitely schizophrenic sequelæ in respect of thinking or even of emotional congruence. A lack of adequate treatment is responsible for the development of many a "catatonic dementia" that was avoidable (though in others one's best efforts seem useless to ward off ruin). Prognosis must in any case depend in considerable measure on the adequacy of practicable treatment. Of inadequate, impracticable, new fangled, or useless treatment there is always more than enough.

CONCLUSION

This is not an illness of which the course is well known and the signs easily read. It is difficult to diagnose, difficult to describe, still more difficult to treat and anticipate, or to study. Its prognosis must at present depend on so many points that the balancing calls for much experience and judgment. It will sometimes be found, however, that expert judgment rests on a few clinical rules such as that abrupt onset of the illness, an adequate cause for it, and a well-adapted non-schizoid personality are the criteria of good prognosis; sometimes even it will rest on general impressions and customary beliefs which have been shown by recent work to be in many points fallacious. It will in others be based on a careful scrutiny of the possible factors in causation, whether a physical damage (e.g., encephalitis lethargica, puerperal sepsis), a pronounced constitutional bias, a shattering emotional struggle, or all three together. In saying this one is not belittling the expert judgment but insisting on the intricacy of its task. Whatever its grounds, such judgment will be tentative. In the present state of knowledge expert opinion as to many things in schizophrenia, and especially as to its outcome, will at best seldom be accurate or confident, except over a short range. It will certainly not be confident in pessimism.

AUBREY J. LEWIS, M.D., M.R.C.P.,
Senior Medical Officer, Maudsley Hospital.

SPECIAL ARTICLES

THE CORONER'S INQUEST
DESIRABLE CHANGES IN LAW AND PRACTICE

THE Home Secretary's announcement of a fresh inquiry into the system of coroners' inquests follows rather quickly upon the amending Act of 1926; but then this Act gave effect to reforms recommended as long ago as 1909. A fresh inquiry is certainly not unwelcome. If, as will probably be found, the country is not yet ready to part with its coroners, some changes in the law or practice may deserve a trial. As we hope presently to show, there are several suggestions worth considering. The new inquiry may be able to tell us whether Scottish analogies are of value to England. Naturally the recent Weymouth inquest has stirred the critics afresh. In the background is the possible conflict between the interests of justice and the dues of the individual. To concentrate attention exclusively upon the privileges and liberties of suspected persons is to forget that a crime, if crime there has been, involves an invasion of the rights of others. The average citizen is ready to suspect the worst if there is any hint of the hushing-up of a scandal. When suspicions are thoroughly sifted in the light of day, public sentiment swings round and sympathises with the victims of cross-examination.

There is nothing new in this for those who recall the Balham mystery of 60 years ago. Charles Bravo was found dead in his suburban home with unmistakable symptoms of antimonial poisoning. To the question how the poison was administered the coroner's jury gave no answer. Several persons had wanted to give their own version on this point, but the coroner closed the inquest without hearing them. Bravo's friends, disbelieving the idea of suicide and suspecting foul play, pressed for a further inquiry. In a decision still quoted as authoritative (Rex *v.* Carter) the Queen's Bench ordered a fresh inquest on the ground that evidence had been excluded which might have thrown light on the cause of death. Sir William Gull said that Bravo on his death-bed solemnly declared he had taken nothing but laudanum. Bravo's widow, strongly cross-examined, was obliged to admit intimacy with Dr. Gully, the sinister imputation being obvious. Gully had to go into the witness-box. Nothing was established against him, and the second inquest resulted in no more specific and conclusive verdict than the first; but his professional and private reputation were most detrimentally affected. Then, the public having supped full of the scandal, it was widely felt that this minute inquiry into the previous lives of the parties was vexatious, unnecessary, and of no value to the interests of justice. So, in cases like that at Weymouth, it seems, we have to choose between two evils—shall the countryside be left to seethe with defamatory rumours, damaging to our confidence in the equal application of the law, or shall the possible victims of the scandal be given a chance to vindicate their characters in open court at the cost of uncomfortable self-revelation? One of these two courses may be chosen, but the public will probably want both and the coroner is sure to be held wrong.

RECENT CRITICISMS

In connexion with the Weymouth example Mr. A. P. Herbert, devoting his gifts not for the first time to a serious crusade for law reform, has lately crystallised in a newspaper article the criticisms against the inquest system. He sees three dangers. First there is the peril of wrong accusation "by reason of the coroner's queer proceedings." Secondly there may be prejudice to an accused person on trial at the assizes through "inquest-generated prejudices"—a risk greatly lessened since the Act of 1926, because inquests now automatically stop as soon as a definite charge is initiated in the ordinary criminal courts. Thirdly without trial innocent persons may be blackened for life with mud thrown by "the kind of coroner who forgets that it is his duty to inquire into the death of the deceased and not the lives of the living." Mr. Herbert concedes

that there are plenty of good coroners; if all coroners were good, he would apparently be satisfied with things as they are. But he pokes some good-natured fun at the tribunal consisting of "one pompous doctor," apparently ignoring the admirable work done and now being done by medical coroners. Medical coroners, he believes, are specially prone to ask fishing questions to test some random theory; that is the method they are trained to follow in professional diagnosis. Abolish the office, he cries, or restrict it to trained lawyers; Scotland gets on without it; if in Scotland a public trial is decided upon, there is one public trial and not two. These latter criticisms have wandered perhaps rather far from Weymouth where the coroner was a solicitor and there was only one "trial" after all. Besides Mr. Herbert there is Mr. Morgan Jones, M.P., who wants the Home Secretary to order all coroners to confine their inquiries to the simple matter of the cause of death "and not ramble as the recent inquiry did."

That sounds easy enough for everybody but the coroner himself. Some may insist that the Weymouth coroner gave too much rope to the legal representatives of both sides, and that the counsel briefed by the police overcalled his hand and concerned himself too much with motive. But was there excessive "rambling" at Weymouth? If the coroner's first impressions of the case offered, say, a prospective choice between accident, suicide, and murder, is it fair to scold him for not conducting the inquest *ab initio* in the light of the conclusion? It is all very well to demand that the procedure and evidence at inquests shall be as rigidly limited as it is at assizes to matters strictly relevant. This is to ignore an elementary distinction. At assizes there is a narrow issue, a specific charge against a specific person. At inquests there is nothing of the kind; all is in the air; each material fact must be groped for, and the scope of the inquiry may alter as the case proceeds.

THE SCOTTISH SYSTEM

What then happens in Scotland when suspicious deaths require investigation? To appreciate the answer in true perspective we must bear in mind that Scottish criminal procedure differs from our own not only in this single point but all along the line. In England, before an accused person is committed for trial at assizes or quarter sessions on some serious charge, there will normally have been a preliminary judicial inquiry in public before the magistrates. In Scotland there is no such thing. Neither justices of the peace nor quarter sessions exercise in Scotland so responsible a criminal jurisdiction as is exercised south of the Tweed. Inquiries into the cause of death are undertaken in Scotland by the procurator fiscal, a local legal officer concerned with the prosecution of offences. He is appointed for each county or other district by the Lord Advocate; if the amount of business justifies it, he is a whole-time official. All cases of sudden, violent, or accidental death are reported to him. He gets reports from the police, the registrar, a doctor, or anybody else. If the report has gone first to the police, it is forthwith passed on to him. He collects and personally sifts all available statements, including the medical statements; he decides whether post-mortem examination is necessary; he withholds the order for burial if he thinks fit. The procurator fiscal makes his inquiry in private, gathering the facts much as the coroner's officer may do in the initial stages of an English inquest, but with the overwhelming difference of a vastly superior authority, completeness, skill, and training. When he has made a full summary of the evidence available for a possible prosecution for homicide, he sends the papers to the Crown Office. They are scrutinised by the Crown Counsel (the Lord Advocate at the top or one of the advocate deputes) who decide whether there shall be a prosecution and, if so, how and where.

So far the difference between the English and Scottish systems coincides with that between preliminary public investigation and private inquiry. It may be added that in the last 40 years Scotland has approximated to the English method. In 1895 Parliament empowered the procurator fiscal to hold public inquiry (with a jury of seven) into all cases of death due to industrial employment. In 1906 this power was extended to enable him to make public inquiry into any case of sudden or suspicious death in Scotland, wherever it appears to him expedient in the public interest. Thus Scotland can have the equivalent of a coroner's inquest if it is thought necessary. The extent of the exercise of this power is slight by comparison with the English use of inquests. In England 65,979 deaths were reported to the coroner during the latest year for which statistics are available, and 30,512 inquests were held. Corresponding figures for Scotland are elusive, but in 1909 Prof. Littlejohn told the Chalmers Committee on Coroners that about 4500 sudden or violent deaths went through the Crown Office in Scotland in a year. Probably the proportion of these cases in which a public inquiry was held under the 1906 Act was almost negligible. If an Englishman is inclined to decry the procurator fiscal's preliminary inquiry before prosecution as an inquisitorial process conducted behind closed doors, the Scots could rejoin that it was not till the nineteenth century that the English magistrates did otherwise. It was not till 1836 that an accused person in England was allowed to inspect all depositions taken against him. It was not till 1848 that the witnesses for the prosecution in England had to be examined in the presence of the accused. It was not till these stages were reached that the preliminary investigation of crime by magistrates in England became an entirely judicial proceeding. In England one vital element in the coroner's inquest is the employment of a jury. There is not the same tradition in Scotland. The report of the Chalmers Committee in 1909 observed that there was a good deal to be said for the Scottish system of private investigation of suspicious deaths; "however," it added, "the jury system is so deeply rooted in English life and history that we do not see our way to advocate any change."

SUGGESTIONS FOR REFORM

If England does not abolish the coroner, what reforms can be suggested? In the first place, it seems obvious that the sufferings of cross-examined witnesses must be aggravated by publicity. Is publicity essential or is the country prepared to surrender it? There are many cases, said the Chalmers Committee in 1909, where no public end is gained by reporting the proceedings at an inquest; the gratification of the public curiosity cannot be weighed for a moment against the intense pain caused to the relatives of the deceased by a disclosure of family matters which have nothing to do with the cause of death. The Committee thought that the presence of a jury was a sufficient safeguard. By statute we now have secrecy in juvenile courts; unsavoury divorce details must not be published;

parties and witnesses must not be photographed in the precincts of a court; if a Bill now before Parliament is passed, nullity cases will be held in camera. If public opinion is ready for secret inquests, the coroner has already the considerable discretionary power of closing his court, and Parliament could strengthen his hands. The new Home Office inquiry will doubtless tell us how far this remedy will serve. A smaller but certainly desirable reform is the formulation of the duties and status of the coroner's officer. At present he is entirely unknown to the law. The Chalmers Committee had evidence that his activities were unsatisfactory where his duties in this capacity clashed with his other duties or where he was underpaid or inadequately trained. The proper qualification of the coroner's jury is another topic for consideration. There is a High Court dictum that coroners should not rely upon the same jurymen time after time, but the practice, not forbidden by statute, is not yet dead. A solicitor had the courage at an inquest last year to protest against the patriarchal composition of the jury; and there are doubtless cases where the selection of jurymen fails to produce a body representative of the community.

"GUILTY OF WILFUL MURDER"

We have left to the last the greatest anomaly of the inquest system—the indefensible verdict of "guilty of wilful murder." The verdict does not mean what it says. It does not consign the person named to the gallows; it merely ensures that he shall presently be fairly tried at assizes to see if he is really guilty or not. A few years ago Mrs. Pace was found guilty of murder by a coroner's jury. At her trial at assizes she was acquitted; yet the adverse finding of the inquest remains on record and brands her as a murderess for all time. The whole system of committal by the coroner may need revision. Just as sundials record only the sunny hours, so the verdicts of coroner's juries, it may be, should be confined to findings which declare death to be due to natural causes or non-culpable accident. Already, under the 1926 Act, the inquest is broken off when the magistrates take hold of the case. It may be that we should extend the Act so that the inquest breaks off as soon as there is anything for magistrates to take hold of. How any such reform can be secured, it is not easy to see. At present the Act of 1887 directs the jury to perform its immemorial function of deciding "who the deceased was and how, when, and where the deceased came by his death, *and, if he came by his death by murder or manslaughter, the persons if any whom the jury find to have been guilty of such murder or manslaughter or of being accessories before the fact to such murder.*" The coroner's inquest might still perform valuable service if the words which we have italicised were repealed; but at least let us get rid of the verdict of "guilty"—as monstrous and meaningless an abnormity as is to be found in the often grotesque survivals of our law.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

EDINBURGH PATHOLOGICAL CLUB

AT a meeting of the Edinburgh Pathological Club held on Jan. 23rd Mr. W. C. Wilson reported clinical, experimental, and pathological observations on burns. These investigations are a continuation of a study which he has been conducting for a number of years. He divides the clinical course into five stages: initial shock, secondary shock, acute toxæmia, septic toxæmia, and healing. Acute toxæmia, though not common when tannic acid treatment is employed, may still be seen in young infants suffering from extensive burns. Clinical investigation indicates that it can occur without dehydration, without concentration of the blood, without significant change in the blood chemistry, and without evidence of bacterial infection. The pathological changes in fatal cases are characteristic, and consist of severe necrotic or degenerative changes in the liver cells at the centre of the lobule. Clinical and pathological studies strongly suggest that acute toxæmia is due to absorption of a toxin from the burned area, and experiments carried out on rabbits confirm this theory. The fluid collected from a burned area becomes strongly toxic after 24 hours. Mr. Wilson finds that toxicity does not depend entirely on the presence of bacteria, and believes that it is probably a result of protein autolysis aided by bacterial action. The toxin or toxins are not in the amino-acid or lower peptide group; they are present in globulin fractions. Their biological actions resemble those of peptones, but not those of unsaturated organic amines. They have a strong depressor effect which is not due to action on the vasomotor centre or the heart. When introduced experimentally they produce in a few hours severe degenerative changes in the liver resembling the changes found in human cases.

EDINBURGH ROYAL INFIRMARY

At a meeting of the court of contributors to the Edinburgh Royal Infirmary it was reported that the waiting-list has now increased to 3406, and that 1153 of these are male surgical cases. The managers are much concerned at this increase and propose to negotiate with other voluntary hospitals and with the authorities in charge of the municipal hospitals with a view to relieving the pressure. Legacies and donations received during the past financial year amounted to £75,336, but £52,315 of this sum had to be utilised to balance the ordinary maintenance account. The annual cost of running the hospital is now about £160,000, and the extension scheme when completed will add nearly £30,000 to the annual expenditure. The hospital has over 1000 beds, the accommodation and treatment provided being entirely free. In submitting his report the convener of the committee stated that "we appear to be approaching, if we have not already reached, the most important and anxious stage in the history of the infirmary." The management of the Royal Infirmary is highly efficient, and the success of its method of administration is a strong testimony to the value of the voluntary system. Most medical men in Edinburgh think, however, that the time is approaching when the managers will have to modify their policy of free admission and treatment for all.

POST-GRADUATE TEACHING

The honorary secretary's report for the post-graduate courses held during the year 1933–34 shows that the number of post-graduates attending during the session was well maintained. The surgical clinics held during the university terms were attended by 195 graduates, while the number attending the medical clinics was 42. Courses of instruction were also given in surgical pathology, child life and health, ophthalmoscopy, and diseases of the ear, nose, and throat. During the summer vacation the general surgical course was attended by 40 graduates, the general practitioners' course by 31, and the class of obstetrics and gynæcology by 20. Classes were

also held in diseases of the blood, modern diagnostic methods, urological surgery and the treatment of fractures, X ray physics and electrotechniques, and orthopædics. The hon. secretary points out that the development of the municipal hospitals has greatly increased the material available for teaching.

GLASGOW SCHOOL-CHILDREN

Dr. Arbuckle Brown's report to the Glasgow Health Department deals with the school year which ended last July. Under present circumstances it is natural that a careful watch should have been kept on any evidence of general impairment of nutrition among the school population, but Dr. Brown says that the percentage of children with bad nutrition was the lowest recorded during the past 15 years. At the same time the proportion of children found to be suffering from rickets continues to diminish. In the course of routine inspection nearly 53,000 children were examined, and it is an encouraging sign of parental responsibility that at more than three-quarters of the inspections the parents were present. Only quite a small proportion (5·6 per cent.) of the defects found at these inspections were regarded as irremediable, and a still smaller proportion (1 per cent.) as having been irremediable since birth. Altogether the work of the school clinics during the year has meant more than 458,000 attendances.

THE HISTORY OF THE SCOTTISH UNIVERSITIES

Delivering the fourth of a series of lectures on the Scottish universities to the Provand's Lordship Club, Glasgow, Sir Thomas Holland, principal and vice-chancellor of the University of Edinburgh, took as the subject of his address the history of this, the youngest of the Scottish universities. It was founded at the end of the sixteenth century, after the stormy period preceding and accompanying the Reformation, when the other three Scottish universities had passed through difficult times. There had always been some attempt on the part of the four universities to keep in touch with one another, but it was only by the Acts of 1858 and 1889 that they were combined in a definite commonwealth, a system which the lecturer considered would have been of immense value to the younger English universities.

Referring to relative standards, Sir Thomas said that the younger universities in England were still suffering from having yielded to the demand of the teaching profession for honours men. Before the war the ratio of honours to ordinary graduates in English universities had been approximately 1 : 2, whereas in 1932–33 it had been the other way about, and had become 2 : 1. Was it likely that most of the students who entered universities were of honours standard? It was not so in Scotland, and the Scottish universities had not altered their standard to meet the demand in the teaching profession for the higher distinction. In 1932–33 the ratio of honours to ordinary degrees in Scotland had been 618 : 1694. There was now a tendency in England to get back to the Scottish standard and to insist on a broad foundation, as well as a specialisation in some group subject.

FURTHER GIFTS TO MIDDLESEX HOSPITAL.—Mr. E. W. Meyerstein has made a further gift of £20,000 to Middlesex Hospital. This is to provide for residential quarters for senior students, particularly those attached to the surgical unit on emergency duty and those attending the maternity unit. Mr. Meyerstein has during the last year given over £200,000 to the hospital.

THE SERVICES

Lieut.-Colonel J. M. Weddell, F.R.C.S., Royal Army Medical Corps, has been appointed honorary surgeon to the King, with promotion to the rank of Brevet Colonel, in succession to Colonel A. C. H. Gray, O.B.E., M.B., who has retired.

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. C. G. Sprague to *Cyclops*; A. C. Paterson to *President* for course at Small Arms School, Winterbourne Gunner, to *Drake* for R.N.B. and for Anti-gas School and as Specialist in Chemical Defence; and G. G. Newman to *Medway*.

ROYAL NAVAL RESERVE

A. B. Concanon entered as Proby. Surg. Lt.

L. S. Anderson, W. S. Parker, and R. A. Mogg entered as Proby-Surg. Sub-Lts.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lts. R. Pedlow and J. D. Simpson promoted to Surg. Lt.-Comdrs. Surg. Lts. J. J. Dwyer, R. P. Davies, and D. A. Williams, resignations accepted.

Proby. Sub-Lt. G. A. Reeves to be Sub-Lt.

ARMY MEDICAL SERVICES

Col. H. H. J. Fawcett, D.S.O., late R.A.M.C., is placed on h.p. under the provisions of Art. 500, Royal Warrant for Pay and Promotion, 1931.

Lt.-Col. A. Irvine-Fortescue, D.S.O., M.B., from R.A.M.C., to be Col.

ROYAL ARMY MEDICAL CORPS

Maj. H. F. Panton, D.S.O., M.C., M.B., to be Lt.-Col.

Temp. Commissions.—Capt. F. T. Boucher to be Maj.

The following successful results are announced of the examination (in written subjects) of officers of the R.A.M.C. with a view to promotion which was held at stations abroad last October: Majs. L. A. J. Graham, J. V. McNally, J. M. Morrison, D. F. Panton, E. J. S. Bonnett, and R. J. Rosie.

TERRITORIAL ARMY

Capt. M. J. Malley, R.A.M.C., to be Divl. Adjt., 42nd (E. Lan.) Div. and Sch. of Instrn., vice Maj. G. A. Bridge, M.C., R.A.M.C.

Lt. R. W. Hendry to be Capt.

TERRITORIAL ARMY RESERVE OF OFFICERS

Capt. N. R. Rawson, having attained the age limit, relinquishes his commn. and retains his rank.

ROYAL AIR FORCE

Flight Lt. C. G. J. Nicolls is promoted to the rank of Squadron Leader.

Flight Lt. T. W. Wilson is placed on the retired list on account of ill-health.

Flight Lt. R. L. Raymond is transferred to the Reserve, Class D.

The undermentioned are granted short service commissions as Flying Officers on probation for three years on the active list: J. W. Patrick, A. W. Smith, J. S. Wilson, C. A. Lewis, R. G. James, G. H. Stuart, and W. G. S. Roberts.

Flight Lts. C. A. Rumball to No. 4 Flying Training School, Abu Sueir, Egypt; E. Thompson, to No. 1 School of Technical Training (Apprentices) Halton; G. H. J. Williams to No. 2 Armament Training Camp, North Coates Fitties; J. F. Ziegler to R.A.F. Depôt, Middle East, Aboukir.

Dental Branch.—A. Maben, L.D.S., is granted a non-permanent commission as a Flying Officer.

INDIAN MEDICAL SERVICE

Majs. to be Lt.-Cols.: C. M. Ganapathy, M.C., N. B. Mehta, and M. A. Singh.

Capts. to be Majs.: W. D. P. Read, T. J. Davidson, and G. S. Gill.

Indian Medical Department.—Asst. Surg. 1st Cl. H. A. T. Wells, M.B.E., to be Lt. (Sen. Asst. Surg.).

CORRESPONDENCE

ST. GEORGE'S HOSPITAL

To the Editor of THE LANCET

SIR,—We, the treasurers of St. George's Hospital, empowered by a unanimous vote of the court of governors of the hospital, are now in a position to declare publicly to those interested in a decision which affects profoundly one of London's best known institutions, that the work of rebuilding St. George's Hospital is to start at once on the site that has been its heritage for the past 200 years.

No justification for rebuilding is necessary. Our crumbling and shored-up walls, our pitiable lack of space which makes it increasingly difficult to keep abreast with the great advances of medicine and surgery, all these speak for themselves; but justification for remaining at Hyde Park Corner will certainly be demanded of us by the public to whom we look for support to carry through our great project.

There is a popular belief that the hospital is sitting on a gold mine. It is not generally known that the hospital, in the event of a sale of the site, would be called upon to purchase the freehold of that part of the property which was bought from the Westminster Estate in 1906. These terms, which were extremely generous, were granted only on the condition that the land in question be used by the hospital for hospital purposes, otherwise the right of pre-emption would revert to the estate at the original figure. To put it plainly, the site is not ours to sell until a considerable sum of money be raised in the first instance.

Our site committee, including experts whom we have called in consultation, have advised us that within the area served by the hospital there is no alternative site available at a price we could afford to pay.

There are those who contend that it is wrong for a large hospital to be in central London at all, and that it should be moved outside. Those who hold this view over-estimate the benefit that a hospital patient may derive from rural (or suburban) air and scenery, and under-estimate the advantages that easy access has for patients, their friends, and their doctors. Loss of accessibility would in itself be detrimental to a teaching hospital such as St. George's.

To rebuild, equip, and endow St. George's Hospital will cost close on a million pounds. Our president, H.R.H. the Duke of Kent, has led the way by suggesting that people who wished to subscribe to some charity to commemorate his wedding should give their donation towards this rebuilding fund. With this and the munificent donation from the Bernhard Baron Charitable Trust, followed by that of Mrs. Meyer Sassoon and Dr. Charles Slater and a multitude of smaller gifts, the fund stands to-day at £61,000. In addition to this we have the promise of Mr. E. W. Meyerstein to subscribe £25,000 on the condition that eight others give a like amount.

We earnestly ask the public to subscribe liberally so that the hospital may retain its place in the capital of the Empire, and remain a monument to the generosity of the great British public, as it has been since 1733.

We are, Sir, yours faithfully,

GREVILLE,
WINCHILSEA,
Treasurers.

Feb. 4th.

THE PURGATIVE ACTION OF MAGNESIUM SALTS

To the Editor of THE LANCET

SIR,—I regret that I had forgotten Prof. Cohen's important investigation on the action of magnesium sulphate when I wrote to you on the action of saline aperients. In 1908 Cook, Slesinger, and I proved that the SO_4 constituent of sodium sulphate and magnesium sulphate does not act by attracting fluid into the lumen of the bowel. I will not repeat the details of our investigations, but the following summary of the analyses made by Mr. Cook in one of our many experiments (Guy's Hosp. Rep., 1909, lxiii., 297) shows that no other conclusion was possible.

Sodium sulphate 3·89 g. were taken at 9.40 A.M. on Dec. 3rd, 1908.

—	Grammes SO_4	Equivalent to cryst. Na_2SO_4	Per cent. in fæces.	
			Fresh.	Dried.
Excess of SO_4 in watery stool (11.25 A.M., Dec. 3rd) over average of two normal stools passed on preceding days	0·065	0·215	0·003	0·266
Excess of SO_4 in normal, *formed* stool of next day (Dec. 4th) over average of two normal stools ..	0·244	0·812	0·181	0·769
Excess of inorganic SO_4 in urine—				
(1) passed in first four hours following administration	0·283	0·945	—	—
(2) passed in second four hours following administration	0·340	1·135	—	—

Hence of the sodium sulphate 3·89 g. taken—

0·21 g. was excreted in the watery stool passed 1¼ hours later.

0·81 g. was excreted in the normal, *formed* stool passed the next day.

0·945 g. was excreted in the urine passed in first four hours following its administration.

1·135 g. were excreted in the urine passed in second four hours after its administration.

0·79 g. was unaccounted for and presumably passed subsequently in the urine and fæces.

In 1926 Prof. Cohen proved that the concentration of magnesium in the blood is not increased when magnesium sulphate is taken as an aperient, which would appear to indicate that magnesium sulphate cannot act from the blood stream. The action of magnesium sulphate is more complicated than that of sodium sulphate, as both the Mg and SO_4 of the former have aperient properties, whereas only the SO_4 of the latter is active; thus $MgCl_2$ is an aperient but NaCl is not. As, however, sodium sulphate and magnesium sulphate are so alike in their aperient properties, although the former contains only three-quarters of the SO_4 present in an equal weight of the latter and Na is without purgative action, it is probable that the SO_4 constituent which they have in common is at least of equal importance with the Mg. From our experiment it appears that SO_4 of both $MgSO_4$ and Na_2SO_4 is rapidly absorbed and excreted in the urine. Possibly it is so rapidly excreted that in the case of the former the increased Mg concentration in the blood is at no time sufficient to be recognised by analysis.

There are, however, other possible explanations of the action of $MgSO_4$ even if it neither attracts water

into the lumen of the bowel nor stimulates colonic activity after absorption. The reflex contraction of the gall-bladder and bile-ducts with relaxation of Oddi's sphincter, which follows contact of magnesium sulphate with the mucous membrane of the duodenum, suggests that the increased secretory and motor activity of the colon may also be a reflex from the upper part of the small intestine, as it occurs after the salt has left the duodenum but before it has reached the cæcum. Alternatively the ingenious suggestion made by Mr. Lincoln Lewis in his letter (entitled Fresh Bile in Ileus) to THE LANCET of Jan. 26th may be correct: the aperient properties of magnesium sulphate may depend upon its reflex action on the gall-bladder, as a result of which the intestines are flushed from above with fresh human bile. Some observations made by Dr. J. F. Venables show that Epsom salts act just as powerfully on the gall-bladder when given by mouth as when introduced directly into the duodenum through a Ryle's tube.

I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, Feb. 1st.

THE HOUSING BILL

To the Editor of THE LANCET

SIR,—As your leading article of Jan. 26th, entitled A Legal Definition of Overcrowding, and Lord Balfour of Burleigh's comments on the Government's New Housing Bill, raised a number of important points which call for further discussion, may I add a few observations on the town-planning aspects of the problem? In the first place it appears only too obvious that the Government makes no attempt to relate housing development to the well-established fact of the industrial *de*centralisation. As Lord Balfour points out, "the Bill makes no reference to factories, workshops, and shops, which are presumably outside the scope of redevelopment."

A great many of the additional houses which are needed should be built in the neighbourhood of the numerous new factories which are now going up outside the existing towns, and these factories, instead of, as at present, contributing to ribbon development, should be collected together in well-arranged groups in order to form the industrial nucleus of new urban communities on sites where land is cheap and where ideal living conditions could be provided.

In your issue of March 10th, 1934, you reviewed at length a pamphlet entitled "A Hundred New Towns for Britain" in which such a scheme of decentralisation was outlined. The arguments in favour of this method of tackling the problem are no less cogent to-day than ten months ago. In fact, as time advances it becomes even more obvious that far too great a burden is placed upon the local authorities if they are required to provide *all* the additional dwellings which are needed within the area under their jurisdiction. Even assuming that with financial assistance from the Government they could erect at reasonable rents blocks of tenements on expensive urban sites, the purely physical task of finding sites in sufficient numbers is likely to prove insuperable. To what extent people will suffer in health by being cooped up in these tall buildings I may leave to members of the medical profession to estimate.

One great advantage of a policy of extensive decentralisation is that when about half of the two million additional dwellings which are needed are provided on new urban sites, the remainder, which for a variety of reasons must be built in the existing towns, need not assume the form of tall tenement blocks but may be arranged in terraces or quadrangles at not more than 30 dwellings to the acre, which arrangement would make possible far more sunlight and recreational space than is provided in even the most recently erected "model" flats for wage-earners.

The fact that the Government intends to introduce a Bill to prevent ribbon building shows that it is alive to the need for the control of urban development outside the existing towns. May I suggest that this latter Bill and the Housing Bill would be rendered much more effective if they could be combined in one comprehensive measure of town and country planning? An examination of the ribbon development would reveal the extent of the industrial decentralisation which is taking place, and should convince the Government of the unwisdom of building enormous numbers of tenement blocks in the existing towns when the factories, which should give employment to the occupants of these new buildings, are being moved from their present congested quarters to other localities. Yet the Government's survey of overcrowding may be welcomed as a necessary preliminary to the adoption of a far-sighted national plan such as is called for by Lord Balfour of Burleigh.

I am, Sir, yours faithfully,

A. TRYSTAN EDWARDS.

Gray's Inn-square, W.C., Jan. 31st.

THE RESERVOIR SIGN OF ACUTE MASTOIDITIS

To the Editor of THE LANCET

SIR,—I should never attempt to tackle an opponent so nearly invulnerable as Achilles, but I am not persuaded that Mr. Asherson deserves the rôle he claims. However, I am really sorry that my quotation from his paper was misleading. The sentence "The more rapid the reaccumulation [of discharge in the aural meatus] is the more urgent is the indication for immediate operation on the mastoid" stands by itself, and I thought it referred to the whole of what had gone before, instead of solely to the month-old case. All will agree that an aural discharge that is still profuse a month after onset provides an indication for mastoidectomy; but this is not a new contribution to clinical teaching. It is quite true that Mr. Asherson avoided the question of *when* to operate: but his paper is entitled "An early clinical sign of acute mastoiditis" and under the heading "Significance of the reservoir sign" he writes, "After the third day from perforation or myringotomy the presence of a positive reservoir sign is diagnostic of acute mastoiditis . . . even when the only sign and symptom present." And it is implicit throughout his paper that when this diagnosis is made the mastoid ought to be opened without delay; this proposition he restates in the last paragraph of his letter of Feb. 2nd. Of course, if he means that although the sign is "positive" and there is "acute mastoiditis" he does not always operate, and that a number of such cases recover without operation, his contention and mine are identical; but in that case I fail to understand the value of the "reservoir sign."

Mr. Asherson in line 13 of his article points out that "any rapid reaccumulation must arise from the mastoid" (not from the tympanum); in line 46 he says that rapid reaccumulation in acute otitis media immediately after perforation does not indicate mastoiditis. This seems to me to prove my thesis that the mastoid antrum and cells are infected from the beginning in acute otitis media; at least it is incompatible with his conception of infection limited to the tympanic cavity.

I am, Sir, yours faithfully,

Clifton, Bristol, Feb. 3rd. E. WATSON-WILLIAMS.

LEFT-HANDEDNESS

To the Editor of THE LANCET

SIR,—Your leading article of Jan. 19th on Left-handedness and Stammer deals with the aggressiveness and sense of fairness often associated with the former peculiarity. There is another biblical story still more gruesome than that of Ehud, in which left-handers took a part. They, like Ehud, were Benjamites (Judges, Ch. 20). It is not specifically mentioned that Benjamin himself was left-handed, but the characteristic was clearly appreciated by his descendants. I can never read Jacob's thumb-nail character sketch of him—"Benjamin shall ravin as a wolf; in the morning he shall devour the prey, and at night he shall divide the spoil" (Genesis, 49, 27)—without admiring the word-sparing description of the typical left-hander. Curiously enough, it was the Ephraimites, descendants of Benjamin's only full brother Joseph, who lost their lives because they could not say "Shibboleth" (Judges 12, 6), which at first sight seems like a speech defect, comparable to a lisp, itself related to a stammer. Probably other factors will be invoked to explain the difficulty in pronunciation, but it seems worthy to note that these rare references in the Bible to left-handedness and speech imperfection should be connected with the son and grandson respectively of Jacob and Rachel.

It will be remembered that hands played an important part in Jacob's life, both as son and parent. He was one of twins, and twins seem to include a high proportion of left-handers. Even in the act of birth he could not keep his hand off his brother Esau, whose heel he grasped. (Genesis 25, 26). Hosea, a thousand years later, thinks the fact significant (Hosea, 12, 3). Later on, with the connivance of his mother Rebekah, Jacob cheated Esau out of their father's blessing by deceiving the blind old man's hands (Genesis 27). When his own time came to "hand" on the blessing to his son's sons, he deliberately reversed the position of his hands in spite of Joseph's protests, and insisted upon placing the right upon the younger grandson's head (Genesis 48), thereby breaking the law of primogeniture, a law that must always seem unfair to the younger members of the family.

I am, Sir, yours faithfully,

Feb. 2nd. W. S. INMAN.

TREATMENT OF APPARENT STILLBIRTH

To the Editor of THE LANCET

SIR,—A daily paper recently recorded the successful treatment of apparent stillbirth by inserting a needle through the skin direct into the cavity of the heart and injecting a cardiac stimulant. A simple plan of treatment, recommended to me many years ago as worth trying in apparent death from asphyxia, was used in the following case of apparent stillbirth. There were no external signs of life, but through the stethoscope an occasional feeble heart beat could be heard. A piece of glass tubing was placed between the lips, which were then held in close apposition; the nostrils were closed by compression and air was blown through the tube. There was no indication that any of the air reached the lungs, but obvious signs that some of it entered the stomach. On again applying the stethoscope it was noticed that the heart beat had become practically normal. Gradually the pallid surface of the body became cyanosed; and after a long interval, during which the cyanosis became extreme, the first respiratory effort appeared as a feeble sigh. The intervals between the sighs gradually lessened until normal breathing was established. The air blown through the tube had obviously served as a powerful cardiac stimulant.

I am, Sir, yours faithfully,

KENNETH R. SMITH, M.D., B.S. Lond.

Sutton, Jan. 29th.

To the Editor of THE LANCET

SIR,—May I report an interesting procedure that may prove helpful in saving lives? The birth of girl twins in our general practice was complicated by the second twin showing no overt evidence of breathing. She was limp and cyanotic; ordinary slapping, manipulation of the body, artificial respiration, cleaning of the throat, and hot and cold water immersions exerted no effect whatever, and after ten minutes of work the prospects were not hopeful. But having read upon one occasion a short article by Victor McLaglen, the star-film and jujitsu expert, describing how upon two occasions he had brought back two men to cardio-respiratory rhythm, after they had been apparently completely knocked out, I decided to try it at this emergency. The method was described by Mr. McLaglen as sitting his patient up, pressing both thumbs deeply behind the clavicles, and at the same time giving a short sharp blow or kick with his knee forwards to the middle of the dorsal spine; apparently the objective was to stimulate the vagus and sympathetic nerves at their entrance to the thorax from the neck. Such a procedure not being easy to perform in an infant without hurting it, we carried out a modification of it. Turning the child on its face, and seizing the upper part of its neck with the thumbs pressing forwards against the region of the posterior spine of the axis, we pressed deep towards the medulla and upper cervical spinal cord, then rotated the neck right and left, and again rolled the muscles of the child's neck to and fro with the thumbs. Immediately the child started to breathe, and in a minute had come round. There must have been some vitality in the child, otherwise such medullary-spinal manipulation would not have brought any benefit.

I am, Sir, yours faithfully,

Charing Cross, Glasgow, Feb. 4th. A. TURNBULL.

WHOLE-TIME CONSULTING APPOINTMENTS

To the Editor of THE LANCET

SIR,—An extensive advertisement appeared last week in your columns that contained some astounding features. Applications were invited from "medical men or women of high qualifications and professional attainments" for the posts of physicians, surgeons, and obstetric surgeons at various hospitals under the jurisdiction of one of the county councils. The main points in the advertisement were as follows:

1. These were whole-time appointments.
2. The holders must be prepared to act as consultants to general medical practitioners outside the hospital, if called upon to do so.
3. Any fees received by the officers appointed must be paid over to the County Council.
4. Appointments would be held during the pleasure of the Council and be subject to three months' notice on either side.

The wording of the advertisement does not suggest that the services of these specialists outside the hospital to which they are attached are intended only for poor persons who have to seek medical aid through the relieving officer, and who would thereby

in the first place come under the care of the district medical officer. If this were so the conditions of these appointments call for no criticism.

As the advertisement appears to me, the County Council concerned are endeavouring to make it possible to have a financial interest in consulting practice outside the precincts of its own hospitals, as any fees thus earned by their officers must be repaid to the Council. It is quite possible that consultation fees earned in this way may be sufficient to pay the salaries of these officers or even to show a handsome profit, in which case their work in the hospitals themselves would cost the Council nothing, or less than nothing. Officers themselves would probably be loth to encourage outside consultations which would only mean increased work without increased remuneration; but they would have no say in the matter, and their suitability for continued employment might well depend on the demand for their services at private consultations and their financial value to the Council. The fees charged for private consultations in the district would doubtless be decided by the Council. If these were low or nil, it is easy to see that general practitioners and their patients would be able to avail themselves of the Council's consultants whatever the financial status of the patients might be, and would not be slow to do so. Even if the fees laid down were standard consulting fees, it would still be a case of unfair competition by the Council against consultants on the honorary staffs of voluntary hospitals in the districts concerned, who have to depend on private consultations for their livelihood. County councils are not usually slow to advertise to their electors benefits, medical or otherwise, that they provide.

If my interpretation of the terms of appointments is correct, this is the beginning of a bureaucratic control of consulting medicine, surgery, and obstetrics with a vengeance, and on the most pernicious lines. It should be opposed by all the forces (if any) at the command of the medical profession. Now the advertisement has been accepted by the medical journals it is too much to hope that there will be no applications, having regard to the overcrowding that exists in all ranks of the profession at the present time, especially in and around London, which is the happy hunting ground for all those who do not think much of their prospects at home, in whatever part of the world that may be. Nevertheless it behoves intending applicants to consider carefully before placing their careers as specialists in the hands of a corporate body subject to political fluctuations, from which they may at any time receive three months' notice to terminate the contract. If this happened, they would find some difficulty in maintaining their professional level in the open market.

I am, Sir, yours faithfully,

Welbeck-street, W., Feb. 5th. B. BUCKLEY SHARP.

THE PROGNOSIS OF TETANUS

To the Editor of THE LANCET

SIR,—I have read with great interest Dr. Mitchell's account in your last issue of the treatment of a case of tetanus with curarine. The observation that the tonic rigidity of tetanus in man can be reduced and controlled by curarine without affecting respiration is an important one. There is one statement in his paper on which I should like to comment: "In view of the serious condition on admission and the duration of the incubation period (and despite the rather insidious advance of the initial symptoms) a fatal prognosis was given."

Tetanus is a disease in which the prognosis can be assessed with considerable accuracy provided that there are no other complications present. It should be based particularly on four considerations: the severity of the wound, the presence or not of local tetanus, the length of the incubation period, and the length of the period between the appearance of the first symptom and the occurrence of the first reflex or clonic spasms (period of onset). Cases with a superficial wound which can be easily treated are usually mild. Cases with local tetanus usually recover. In my experience cases with an incubation period of seven days or longer have all recovered (excluding patients over 60). Of eleven recoveries, four had an incubation period of seven days and one of eight. Patients with a period of onset of three days or more have with one exception recovered. The exception had an incubation period of four days. In Dr. Mitchell's case the wound was superficial and was dressed at once. There was definite local tetanus on the ninth day, giving an incubation period of eight days (? seven days by dates given). The period of onset was slow, three and a half to four days. The patient was able to go to work three days after the first symptoms appeared. Clonic reflex spasms were apparently not severe or sustained on the day of admission four days after the onset of symptoms. That they did not persist may have been due to curarine. In view of the above it is difficult to see why an unfavourable prognosis was given unless other complicating factors were present.

My excuse for commenting on the prognosis of a case which I have not seen is that it is only by careful consideration of such data that the value of a new treatment such as curarine can be assessed.

I am, Sir, yours faithfully,

Cambridge, Feb. 4th. LESLIE COLE.

EXTENSIONS TO HOSPITALS.—The Nottingham Hospital for Women, which was built in 1929 to replace two small hospitals, has accommodation for 60 beds, but it is hoped to build a new wing to take another 40, as there is a long list of patients awaiting treatment. The land is ready for the extension and plans drawn up, but £20,000 will be required to carry out the work.—A new pay-bed block is to be built as a unit of the Nottingham General Hospital for those who are not entitled to use its voluntary section and are unable to pay nursing-home fees. Some beds are also to be provided for the use of well-to-do people who prefer hospital treatment.—Maternity and out-patients' department, new accommodation for nurses, and a new children's ward at the Romsey Hospital have been opened by Mrs. Crosfield, wife of the president of the hospital.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Feb. 21st, at 3 P.M., Mr. David Levi will give a demonstration on tumours of the stomach at the Wellcome Museum, Euston-road, N.W. Forthcoming special course include an evening clinical and pathological courses at the National Temperance Hospital on Tuesdays and Thursdays at 8 P.M. (Feb. 19th to March 7th); in medicine and surgery at the Prince of Wales General Hospital (Feb. 25th to March 9th); in orthopædics at the Royal National Orthopædic Hospital (March 11th to 23rd); on children's diseases at the Princess Elizabeth of York Hospital (March 2nd and 3rd); in clinical surgery at the Royal Albert Dock Hospital (March 9th and 10th); and on chest diseases at the Brompton Hospital (March 23rd and 24th). Courses, demonstrations, and lectures arranged by the Fellowship are open only to members and associates. The secretary of the Fellowship may be addressed at 1, Wimpole-street, London, W. 1.

PANEL AND CONTRACT PRACTICE

Temporary Residents

THE distribution committee for England advises the Minister of Health on the proper allocation of funds for temporary residents between the various insurance committees. The calculation is based on the number of insured persons which leave an area for a while and become a charge on another committee for treatment while away, set against the number who come into the area for whom the committee will receive payment. The average value of work done for a temporary resident in the whole of England has been worked out at 8*s*., The situation in Portsmouth is interesting (Brit. Med. Jour. Suppl., Jan. 19th, p. 19). This committee receives more "ins" than "outs"; approximately two come into the area to one going out. In 1934 the "ins" numbered 1129 for which Portsmouth will receive 1129 at 8*s*.=£451 12*s*. The figure for "outs" is not yet available but for 1933 it was 591; at 8*s*. a head this amounts to £236 8*s*. Assuming that the figure for 1934 "outs" is the same as 1933 the Portsmouth committee should only receive about £215 4*s*. But the local doctors claim from the committee £790 6*s*., or £338 14*s*. more than the committee receives from the pool to pay them for this work. This loss must be shared by all the 96 doctors on the Portsmouth panel. Moreover the temporary residents go mostly to the holiday-maker area; here eight doctors with one-tenth of the whole Portsmouth panel have nearly one-quarter of the temporary residents. In other words eight doctors are taking about £50 from the remaining 88 doctors—and this happens year after year. A scrutiny of the work done for these temporary residents shows that the attendance works out at 9*s*. 9*d*. a resident or about five units, whereas the fee now paid is 15*s*. The panel committee is to consider a readjustment of the local distribution scheme.

Hospitals and the Drug Fund

The supply of medicine and appliances to insurance patients by hospitals via the insurance practitioner was debated at the London panel committee last month so hotly as to lead to a humorous protest from the chairman. It arose through an almoner writing to an insurance doctor to say that a surgeon on the staff thought some particular form of bandage would be beneficial to his patient, and as the hospital had been at some expense with the case already and the bandages could be obtained on the drug fund, asking him if he would order it. The practitioner, having ordered the appliance, began to be doubtful of the legality of his act, and eventually the matter came before the Insurance Acts Committee who wrote to the panel committee about it. The ruling was to the effect that treatment ordered by a hospital for an insured person must be supplied by the hospital and not prescribed by the insurance practitioner on the drug fund. The patient, it seems, cannot be under hospital treatment and obtain drugs or dressings from his insurance practitioner for that treatment even if the doctor agrees with what is being done. In this respect treatment differs from certification.

When an insurance practitioner sends a case to hospital for treatment he must give the certificates required, but he is not responsible for certification if the patient goes to hospital on his own initiative. As the certificate states that Dr. A. has examined Mr. X. on the undermentioned date it would seem to be permissible to examine a patient from the point of view of incapacity for work, when being treated at hospital, but not—so it was stated at the committee meeting—from the point of view of treatment and the provision of dressings or drugs for such treatment. If this is correct—and we are inclined to doubt it—the regulations need amending, for an impossible position would arise if an insured person could come to his doctor's surgery and say, "You sent me to hospital with a septic finger which is being treated at hospital by fomentations, but I have run out of boric lint; will you order me some more? I shall want a certificate also." On this interpretation the doctor's duty would be to give the certificate, if satisfied about incapacity, but not to issue a prescription for the lint because the hospital was treating the case. Some hospitals issue forms like this:

> DEAR SIR,—The undermentioned, who is stated to be a panel patient of yours, is desirous of obtaining free medicine from a panel chemist. I am, therefore, requested to send you a copy of the prescriptions ordered here, so that, if you think fit, you may enable this to be done.
>
> I am, dear Sir, yours faithfully,
>
> Out-patient Visitor.
>
> (Then follows the prescription.)

Hospitals naturally wish to conserve their outlay on drugs and dressings, and patients do not want to pay for medicine that they can obtain under the Act for nothing. The insurance practitioner should be careful not to charge the drug fund with things to which an insured person on his list is not entitled by reason of having placed himself outside the Act by attending hospital. Similarly the administration of gas as an anæsthetic for dental extraction is outside the Act and must be paid for privately, although the administration of gas for the opening of an abscess would be a service inside the Act for which no charge could be made.

PUBLIC HEALTH

The Squinting School-child

AN excellent advance in school medicine is the extension of the oculist's work to children before they enter school. Dr. C. Franks (Durham) says, "it is now four years since the treatment of baby squinters has been carried out by the school oculist and each year has shown more and more emphatically the enormous advantage to the child on attaining school age." Before this arrangement was made it was usual for a squinter to reach the oculist first as a school-child at the age of 6 or 7, when it was generally found that the vision of the squinting eye was 6/36 or less. It is then too late to expect much from home treatment. But with children who have come to the oculist before school age it is usual to find on examination as school entrants that the visual acuity of the squinting eye is nearly equal to that on the sound side. At Bristol Dr. R. H. Parry tells us that 110 cases under school age were treated, most of them referred from the infant welfare department. Dr. H. Osborne (Salford) writes: "Spectacles are advised in all cases of squint to be worn constantly in the majority of cases, but sometimes when the squint is only seen occasionally and especially if the child is over 10 years old, they may be worn for

all school work and reading, writing and sewing, &c., at home and also when attending the cinema." Some may differ from him on the wisdom of allowing such optional use. In very young children Dr. Osborne has tried ordering drops to be applied to the good eye twice daily for a few weeks, so that the squinting eye has to do all the work. In some cases a cure has been effected by this treatment, in others the improvement has been only temporary and the squint reappears later. Dr. J. E. Spence (Eccles) states that since most of the cases of squint have been dealt with before school life this defect has simply been noted at routine inspection for observation and continued treatment. In only a few cases where the amblyopia is marked is operation found to be needed towards the end of school life. Dr. V. T. Thierens (Blackburn), while insisting on the need for early treatment is not so confident of results; in divergent squint with high myopia, and in the alternating convergent squint without refractive error, the prognosis is, he says, unfavourable. On the other hand, alternating convergent squint with refractive error, or divergent squint with slight myopia, offer fair prospect of improvement. Such improvement, he adds, is not to be anticipated unless the parents coöperate to the full with the oculist. It is astonishing how unhelpful parents often are among all classes of the community.

In the preventive treatment of squint more and more use is being made of fusion methods. At the Stockport squint clinic Dr. Josephine Walmsley uses an attachment holding a prism which can be fitted over one or both lenses of a pair of spectacles. The strength of the prism is then gradually reduced until it is no longer needed. The prisms are loaned by the education committee and remain their property; the same set can be used by a large number of children with a saving of expense both to committee and parents. Of 65 cases of squint, 53 monocular and 12 alternating, treated at the clinic in its first year, 28 were cured, 11 definitely and 15 slightly improved, 11 have shown no improvement as yet. Out of 48 cases with defective vision 34 gained in visual acuity, some to a great extent; restoration of binocular vision must safeguard these children against present-day risks of the road. The improvement in personal appearance assists their chances of getting employment. At Torquay, under Mr. J. M. Thomson, exercises in fusion training are supervised by the school nurse. Mr. F. N. Roberts is organising something of the same kind at Rowley Regis, and at Smethwick Mr. Archer Hall refers cases to a special fusion training department at the Birmingham and Midland Eye Hospital. Dr. T. N. V. Potts also notes encouraging results in the West Riding where there is a squint clinic at Sowerby Bridge.

Vision at first examination.	Vision after an approximate interval of two years.								Total
	<6/60	6/60	6/36	6/24	6/18	6/12	6/9	6/6	
<6/60 ..	3	—	—	—	1	—	—	—	4
6/60 ..	—	—	—	—	—	2	—	—	2
6/36 ..	—	—	1	1	3	2	—	2	9
6/24 ..	—	—	—	—	3	6	1	2	12
6/18 ..	—	—	—	—	1	3	5	2	11
6/12 ..	—	—	—	—	—	1	1	4	6
	3	—	1	1	8	14	7	10	44

The amblyopia which is not caused by squint is also being studied. In Leicestershire Dr. Constance Walters describes 66 cases of amblyopia due to difference of refractive error in the two eyes without squint. Without correction the visual acuity tends to decrease with time and spectacles do not improve the vision appreciably when first worn. The constant wearing of glasses over a period of two years or more does improve the sight in a large proportion as the Table shows.

These examples illustrate the value of constant supervision. The other side of the picture is drawn by Dr. H. J. Rae (Aberdeen) who gives instances of the bad results of not wearing spectacles constantly as ordered. He also mentions that the horn-rimmed frames which are becoming so popular being circular may lead to wrongly placed cylindrical lenses through rotation. For children, he thinks, cylinders should always be prescribed as oval lenses.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 26TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2954; diphtheria, 2397; enteric fever, 19; acute pneumonia (primary or influenzal), 1115; puerperal fever, 43; puerperal pyrexia, 90; cerebro-spinal fever, 20; acute poliomyelitis, 7; acute polio-encephalitis, 3; encephalitis lethargica, 9; dysentery, 16; ophthalmia neonatorum, 83. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in infectious hospitals of the London County Council on Feb. 4th–5th was as follows: Small-pox, 0 under treatment, 0 under observation; scarlet fever, 1325; diphtheria, 2203; measles, 169; whooping-cough, 294; puerperal fever, 16 mothers (plus 4 babies); encephalitis lethargica, 269; poliomyelitis, 4; "other diseases," 318. At St. Margaret's Hospital there were 18 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 7 (0) from measles, 5 (0) from scarlet fever, 18 (1) from whooping-cough, 55 (10) from diphtheria, 37 (14) from diarrhœa and enteritis under two years, and 56 (6) from influenza. The figures in parentheses are those for London itself.

Birmingham reported the only death from enteric fever. There were 5 deaths from diphtheria at Liverpool, 3 at Derby, 2 each at Hendon, Bradford, Hull, Leeds, Salford, Worcester, Great Yarmouth, and Exeter. Birmingham reported 5 deaths from influenza, Leeds 3.

The number of stillbirths notified during the week was 283 (corresponding to a rate of 47 per 1000 total births), including 45 in London.

ROYAL EDINBURGH HOSPITAL FOR INCURABLES.—This useful hospital, which was opened in 1875 with 22 beds, now has accommodation for 200 patients. The annual report shows that 328 patients were treated during the past year. Cases of cancer, chronic rheumatic affections, and chronic diseases of the nervous system form the majority of the cases treated. Extraordinary income from legacies and donations for the past year amounted to £18,533, of which £5471 was required to meet the deficiency of income for the ordinary maintenance account. Invested funds now amount to over £160,000.

LIVERPOOL HEART HOSPITAL.—An appeal for £20,000 to build an institute at this hospital for the study of high blood pressure is supported by Dr. I. Harris, hon. physician to the hospital. Medicine, he points out, was formerly advanced through isolated efforts of individuals; effective investigation of such problems as high blood pressure can only be made by a number of workers in coöperation. Research must be organised as war is organised, and there must be a separate organisation for each of the main problems of medicine, coördinating the efforts of the whole country. The facilities available at the Oxford-street hospital are particularly favourable for investigating the whole problem of high blood pressure; he would like to see it become a national centre.

OBITUARY

HAROLD THEODORE THOMPSON, M.D. Camb., F.R.C.P. Lond.

THE death occurred on Feb. 3rd, at Longfield, Great Missenden, of Dr. Theodore Thompson, physician to the London Hospital. The event was sudden and came as a shock to his many friends, for he was still in full activity and only 57 years of age.

Harold Theodore Thompson was the son of Mr. Henry Thompson of Chester, and received his scientific and medical education at Cambridge where his career was throughout of real distinction. He was a foundation scholar of Christ's College, a wrangler in the mathematical tripos of 1899, a success which he followed up by securing a place in the first-class in the Natural Science Tripos of the following year. He took the B.Sc. Lond., and proceeded to the London Hospital for clinical training with scholarships in anatomy and physiology, which he supplemented later by scholarships in medicine and pathology; he graduated in medicine in 1903, took the F.R.C.S. Eng. in 1904, proceeded to the M.D. degree in 1906, and was elected F.R.C.P. Lond. in 1911. At the London Hospital he filled the house appointments, served as medical registrar, and was elected assistant physician to the hospital at the first vacancy. At different times he was also a member of the staff of the Hospital for Sick Children, Great Ormond-street, and that of the Poplar Hospital. There can have been few men more perfectly equipped by academic and practical accomplishment to develop into a competent consulting physician, and Theodore Thompson possessed also the fitting character and temperament for success, as the following appreciation from a colleague shows vividly.

Photo by J. Russell & Sons.

DR. THEODORE THOMPSON

Dr. Robert Hutchison writes: "He was an outstanding example of the best type of clinician, for although he had particular knowledge of neurology, of the diseases of children, and of life insurance work, he never regarded himself as a specialist but always maintained a wide outlook over the whole clinical field. He early acquired a large practice as a consultant, and in that capacity gave of his best unsparingly both to doctor and patient. It is probable, indeed, that his forgetfulness of self actually shortened his life. He was, too, one whose human kindliness soon made him the friend of all who came in contact with him, and for this reason, as well as on account of his professional skill, he often received the compliment of being consulted by colleagues about their own health or that of some member of their families; he was pre-eminently a doctor's doctor. It is not surprising that the demands of practice left him little time or energy for the public activities of the profession even if his retiring disposition had not made these uncongenial. He was therefore rarely seen at the meetings of societies, and for the same reason he wrote little, although his activities, mainly neurological, were always of high quality and often of enduring value. As a teacher at the London Hospital he was at his best in the wards and out-patient room. His clear and practical instruction was highly appreciated by the students, and his special post-graduate demonstrations were always largely attended, whilst throughout his whole hospital career he set an example of single-minded devotion to his work and of an unvarying courtesy and kindness to everyone, which will make him greatly missed. He won his way to the front rank by sheer ability and hard work, and his great intellectual qualities were combined to an unusual degree with a singular modesty and simplicity."

With more detailed reference to his writings it should be noted that his contributions, mainly to the literature of neurology, were made in the form of scattered papers, and he has no systematic text-book to his name. He gained the Raymond Horton Smith prize at Cambridge for a thesis on the changes of sensation associated with gross lesions of the spinal cord; he wrote in the *Journal of Anatomy and Physiology* on abnormal structures at the base of the bladder; and in *Brain*, in collaboration with Sir Henry Head, on the grouping of afferent impulses within the spinal cord. He wrote in THE LANCET (1909, i., 749) on tabes dorsalis, and went closely into the nature of the pathogenic changes, as gathered from investigations in conjunction with Head. A further good example of his learning and clinical ability was furnished by a paper communicated to these columns on the diagnosis of lepto-meningioma of the spinal cord (THE LANCET, 1929, i., 325) and recording the successful treatment of three cases. He wrote on telegraphist's cramp from information obtained as a member of the Postmaster-General's committee on the subject, and was a specialist medical referee to the Home Office for occupational neuroses. Thompson was also an expert on the whole subject of life assurance. He communicated to the transactions of the Medical Assurance Society a paper on syphilis of the nervous system in relation to life assurance; he was chief medical officer to the Royal Exchange and to the Royal and Pearl insurance companies, and was quite recently president of the Medical Assurance Society.

Dr. Theodore Thompson married in 1905 Elinor, daughter of Mr. Edward Waller, of Alexandria, and leaves three sons and one daughter. His home life was singularly happy, and deep sympathy will be felt with his family in their bereavement.

GEORGE MATHESON CULLEN, M.D., F.R.C.P. Edin.

LATE MEDICAL OFFICER, DEPARTMENT OF HEALTH, SCOTLAND

THE death occurred on Feb. 1st of Dr. George Matheson Cullen, a prominent member of the Scottish Board of Health, and also an outstanding personality among the Roman Catholic community of Scotland. A native of Edinburgh, he was educated at St. Vincent's College, Castleknock, and the University of Edinburgh, doing post-graduate work also in Paris. He graduated as M.D. Edin. in 1892, took the B.Sc. in

that university, and was for a time in practice, but for some 30 years, until his retirement in 1932, was associated with the medical services of Scotland.

We have received the following notes on his career and personality from Dr. J. R. Currie, professor of public health in the University of Glasgow: "George Cullen was from the first a firm believer in the Insurance Act in which he foresaw a promise of a cure for the social ills of his time. To this belief he bore practical witness when he resigned an established position in Edinburgh to enter the civil service on the staff of the Scottish Insurance Commission. As sometime convener of the public health committee of the Corporation of Edinburgh, he was able to bring to his new duties an extensive practical experience of local government. He seemed, moreover, to possess the gift of establishing friendly contacts, and so did much to smooth the bristling difficulties which confronted the new régime. Another valued asset was his sound clinical knowledge, so essential to every medical administrator, though many medical administrators do not seem to know it. Along this channel much of his energy came to be directed to the question of prescribing, more especially in its financial aspects. This was work of almost endless detail, involving among other problems that of the proprietary preparations. He found a chaos of contradiction, but evolved in the end a new code and a new order. An important office which he held during the war was that of visitor to the Emergency Committee, the authority for medical recruiting in Scotland. In these duties which demanded both tact and sympathy he rendered notable service.

"Beyond and above the outstanding qualities which he exhibited as a civil servant, George Cullen was a man of high attainment and culture in the fields of religion and philosophy, and in history, especially the history of mediæval Europe. He read Latin as easily as English, and French, Italian, and Spanish as easily as Latin. As a devout Catholic he held fast to his faith which appeared to guide his every action, and produced in him an imperturbability of spirit which knew no temporal fears. When he retired from the Service lately there was widespread regret in both lay and medical worlds. The news of his death, so quickly following comes with the force of a repeated shock, and deepens the sense of personal loss. An example to all for his unswerving faith, his devotion to the duty committed to his hands, and a genius for friendship which through much understanding could forgive much. He will long be remembered by the very many who had the privilege of his acquaintance, and long deeply mourned by those who knew him best."

JAMES WILLIAM BOND, M.D.

Dr. James William Bond, who died at his London house in New Cross, was well known as a laryngologist in his day. He received his medical training at University College Hospital where he was Atkinson-Morley scholar, and graduated in 1879 at the University of London with honours in medicine and forensic medicine, proceeding to the M.D. in 1881. He filled many of the resident posts at University College Hospital, including that of ophthalmic assistant, and was for a time resident medical officer there, and later at the Birmingham General Hospital. On return to London he was elected physician to the Hospital for Diseases of the Throat, Golden-square, and contributed to our columns and to those of the *British Medical Journal* clinical papers on diseases of the nose and throat. His professional position as a specialist was recognised by his choice as president of the laryngological section of the Royal Society of Medicine. Dr. Bond was 82 years of age at the time of his death.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Overcrowding and Public Health

IN the House of Commons on Jan. 30th Sir HILTON YOUNG (Minister of Health), in moving the second reading of the Housing Bill, said they had failed to grapple with overcrowding in the past largely because they had failed to recognise that they could not remedy overcrowding unless they were prepared to find the means for rehousing a large proportion of the dwellers in the central areas near the scene of their original home. In laying down a plan of campaign the first essential was to arrive at a standard of what overcrowding was—to lay down a national standard of accommodation. The overcrowded house had been an offence since 1850, but it had been impossible to enforce the offence because there had been no definition of what overcrowding was, and secondly, because there had been no alternative accommodation. A national standard of accommodation had been arrived at in agreement with housing authorities and medical officers of health. It had two foundations: decency, the separation of the sexes over 10 years of age, and space, that there was enough accommodation for each person. The method of arriving at the standard was to say that there should be so many persons per room, and then to correct that by reference to rooms below a certain size. The standard which they laid down now need not be regarded as the ultimate ideal. The Minister could make temporary extensions in the standard for districts which, owing to their particular conditions, could not be readily fitted into the national standard at once. To make sure that the discretion was not arbitrary, it was proposed that extensions of the standard should be laid down on the advice of the new Housing Advisory Committee. The second provision for elasticity was to enable local authorities to deal, by means of licences, with particular cases where hardship would arise by a rigid enforcement of the standard.

The next step would be to survey the conditions to ascertain where and to what extent there was overcrowding in excess of that standard. This survey would be carried out by the housing authorities and would give for the first time an accurate knowledge of the extent of the evil. After the surveys the intention was that the housing authorities should boldly take over the central overcrowded, badly constructed, badly developed areas, and then clear them to the extent that was necessary and redevelop them as regarded the lay-out so as to make the most economic use of the sites, and then reconstruct or rebuild so as to house the greatest possible number of wage-earners on those sites under proper conditions. Provision was also made in the Bill for "reconditioning," that was, improving the structure and attending to such matters as damp, by putting in water-closets and bathrooms, and attending to drainage and light and air in houses that were too good to be pulled down, but which failed to come up to a proper standard.

Under the Bill it was a punishable offence to overcrowd a house. That offence would be, first of all, that of the occupier of the house who was actually responsible for the persons living in the house. In the second line it would also be an offence if the

landlord did anything which he ought reasonably not to do which conduced to overcrowding, or if he left undone that which he reasonably ought to do which conduced to overcrowding. It was not, of course, made an offence on the part of the landlord if anything happened over which he had no control. It was proposed that there should be an appointed day under the Bill after which any fresh overcrowding would be a punishable offence, but any overcrowding which existed before the appointed day would be protected against prosecution. All existing occupants would be protected when the offence first came into existence. They would be protected unless and until the person who would otherwise have committed an offence was made an offer of alternative accommodation which was reasonable for his purpose. By "reasonable" was meant reasonable from the point of view of space and room to accommodate his family without overcrowding; reasonable from the point of view of situation; and reasonable from the point of view of rent. If a person refused that accommodation and continued to live in overcrowded conditions he might lose his protection. There was also a special protection for an occupant whose house became overcrowded owing to a child reaching the prescribed age.

The Government were taking as their general basis the rule that subsidies should be provided by the State in connexion with the scheme wherever they were necessary to enable houses to be built at rents which were appropriate to the tenants for whom they were intended. Flats, for example, on the more expensive sites could not possibly be built at economic rents without a subsidy. Two-thirds of the money required would come from the Exchequer and one-third from the rates, except in the case of agricultural cottages, where it was proposed that the contribution from the housing authority should be £1 per house and another £1 from the county council, and that a subsidy which began at £2 and rose to a maximum of £8 should be provided by the State. The subsidies were designed on a basis of producing for the overcrowded tenant a flat or house which would let at an inclusive rent of round about 10*s*.; that was 7*s*. without rates. In rural areas the corresponding figures would be from 3*s*. to 5*s*. The averaie size of family in this country had now fallen to 3·7, and owing to the very big preponderance of families consisting of three and two persons the average size of dwellings which they had to provide was substantially less than might be supposed. The subsidy earned by the housing authority would be the same in respect of every dwelling provided, whether it was large or small. Under the Bill they would encourage coöperation between the housing authorities and the voluntary associations and public utility societies. Those bodies were to have fresh facilities for obtaining working capital. As regarded subsidy, they would stand in exactly the same position as the housing authorities, and it would be open to the housing authorities to make any contribution to them from the rates of which they approved. Powers were taken for the housing authorities to appoint permanent bodies of management commissioners with the help of a Central Housing Advisory Committee. There was no reason why building under the Bill should not begin at once as soon as the measure was passed.

Dr. ADDISON said that the Minister's definition of overcrowding would stop action in a number of cases where action was required. Houses which might be dilapidated, but which might not be technically overcrowded, were automatically shut out of the Bill, and there were hundreds of thousands of such houses. It was of first importance that there should be some provision in the Bill prescribing a limit to the number of flats to be provided on the sites, and he hoped the Minister would also introduce some conditions relating to the accommodation to be provided inside the dwellings. Within 18 months of the passage of the Bill the local authorities would be involved in a sea of trouble due to the complicated questions that would arise. The limitations placed on the efforts of local authorities made him not very hopeful that very material results would be obtained from the Bill.

Sir F. FREMANTLE said that between 1911 and 1921 the census showed an increase of houses of a little over 250,000, and an increase in population of 1,750,000. That was an average of two houses for every three extra persons. That was shown in the actual reduction of the average number of persons to each occupied house. In 1901 the average was 5·2; in 1931 it was 4·4. The proportion of population living over two to a room in England and Wales was shown by the census to be reduced from 9 to 7 per cent., and in London from 18 to 13 per cent. It was still a terribly high proportion. The invaluable thing in this Bill was the laying down of a definite standard and the provision of power and machinery to enforce the standard on the one hand, and to provide other houses for the displaced people on the other. This Bill dealt with what was possible and practicable, although many of the hard pressed local authorities would find even this standard impossible to work to. One of the great difficulties in this question was that the new houses had tended to strain off the cream of the population, leaving the lower section of each class who were less likely to make good tenants, more especially as they were immobilised until 1932 by the Rent Restrictions Act. The people who were least able to provide for themselves converged on the existing crowded areas. There was a certain percentage of people who did not wish to move and who made bad tenants. As regarded the ventilation of the area of accommodation in a house, its suitability did not depend so much on the actual cubic or superficial space as upon the amount of air coming into the rooms. Therefore the question of inspection and management must not be overlooked. The success of the Bill would depend to a great extent upon frequent inspection by sanitary inspectors. There was a strong case for making the appointment of county sanitary inspectors compulsory. They would be a guide and, if necessary, a goad to local inspectors. There might be some difficulty in getting medical officers to be keen on a scheme dealing with houses with only two bedrooms. In the past perhaps they had gone too far in saying that all houses ought to have three bedrooms, but he feared there would be a difficulty in preventing houses with only two bedrooms from being overcrowded. But, after all, the housing laws were only the framework. An improvement of the housing of the people must depend mainly on the will of the people, guided largely by public opinion.

Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry), replying to the debate, said that survey under the Bill could start at once. By the time the Bill was through the House they hoped that most local authorities would know what the measure of their overcrowding was. Under the provisions of the Bill any district in London could be redeveloped without going to Parliament. Large sites in Paddington, Bethnal Green, or Stepney could be made available for rehousing; that would help to clear up the basement problem. He hoped the L.C.C. would deal with the London Building Code in the Bill they were promoting.

Unemployment Relief Regulations

On Feb. 5th, when the House of Commons again considered the Supplementary Estimates for the Unemployment Assistance Board on report, Mr. OLIVER STANLEY, Minister of Labour, said that in view of what he had told them with regard to cases of which he had heard, and the feeling both in that House and outside with regard to some of the cases that had occurred, the Board had considered the situation afresh and had decided, and the chairman informed him that the Board were issuing immediate instructions to their officers that all applicants to

the Board should be assessed at the assessment under the Regulations if that was higher than the current transitional payments determination, or, where the current transitional payments determination had been reduced by the operation of the Regulations, at the current determination. Where reductions due to the Regulations had already taken place retrospective payments would be completed as soon as the pressure of work permitted, and for their subsequent procedure the Board would require the necessary Parliamentary sanction. The Board would undertake an immediate examination of the position, and in due course would make the necessary proposals to him. The effect of that was that during the period which everyone agreed must elapse before the necessary investigations could be carried through, and the necessary alterations, if any, made in the Regulations, the applicant would be entitled to the increase under the Regulations, but there would be a temporary holding up of any reduction that the Regulations would bring. That would apply to all applicants.

HOUSE OF COMMONS

WEDNESDAY, JAN. 30TH

Malaria in Ceylon

Sir WILLIAM DAVISON asked the Secretary of State for the Colonies whether his attention had been called to the recent serious epidemic of malaria in Ceylon whereby many hundreds of thousands had been affected, while some 2000 had died; whether he was aware that the Ceylon popularly elected State Council a year ago rejected a mosquito ordinance, the object of which was to prevent the spread of malaria; and what action was being taken to see that the health services of the island were more adequately dealt with in the future than they had been in the past by the local government.—Sir PHILIP CUNLIFFE-LISTER replied: I have received regular telegraphic reports from the Governor during the outbreak and I am glad to say that he has recently informed me that the epidemic is showing a distinct decline in most districts. The answer to the second part of the question is in the affirmative. But as far as my present information goes, the passage of that measure could not have prevented the severity of the recent outbreak which appears to have been largely due to exceptional climatic conditions in an area in which malaria is not endemic. Prompt measures appear to have been taken to deal with the situation, both in regard to treatment of the sick and to general relief measures. The severity of the present outbreak directs renewed attention to the importance of framing a comprehensive plan of preventive activity; and the Colonial Office will, of course, give to or secure for the Ceylon Government all help possible in such an effort.

Road Accidents and Alcohol and Drugs

Mr. RHYS DAVIES asked the Minister of Transport whether he would consider appointing a committee of medical experts to investigate the place of alcohol in the causes of road accidents.—Mr. HORE-BELISHA replied: In order to meet the hon. Member's desire and the many representations which have been made to me, I will invite the British Medical Association to say whether they could usefully make any observations on the subject.

Mr. WHITESIDE: Will the Minister recommend an amendment of the law under which a man is assumed to be in charge of a car although he may have no intention of driving it, and may in fact be incapable of doing so?

Mr. GUY: Would the Minister consider inserting an appropriate warning on this subject in the next edition of the Highway Code?

Mr. RHYS DAVIES asked the Home Secretary what measures were taken by the police, coroners, and other responsible officials to ascertain in cases of road accidents whether those driving vehicles were under the influence of alcohol.—Sir J. GILMOUR replied: If the circumstances suggest that a driver who has been involved in a traffic accident was under the influence of drink or drugs, it is the well-established practice for the police to arrange for his examination by a police surgeon and also, if the person concerned wishes it, by a doctor selected by himself. In any case where a death has resulted from the accident the result of the police surgeon's examination would be made available at the inquest and also in any criminal proceedings which might be taken.

Mr. H. WILLIAMS: Is my right hon. friend aware that the report on fatal accidents in 1933 reveals that fact that 99 per cent. of the accidents were due to people who were sober?

Constitution of Durham University

Mr. MARTIN asked the Prime Minister whether the Royal Commission which had been inquiring into the constitution of Durham University and its constituent colleges had now reported; and when the report was likely to be made public.—Mr. MACDONALD replied: The Commission have not yet reported, but I understand that they hope to present their report towards the end of February. Until the Commission have reported, the question of publication does not arise.

Circulation of Educational Films

Mr. VYVYAN ADAMS asked the Secretary of State for Foreign Affairs when the Government intended to ratify the convention approved by the League of Nations in October, 1933, for the international circulation of films of an educational character.—Sir JOHN SIMON replied: His Majesty's Government propose to ratify the convention as soon as the necessary legislative authority has been obtained to enable them to give effect to their undertaking.

THURSDAY, JAN. 31ST

Sewage Scheme and Atmospheric Pollution

Mr. DORAN asked the Minister of Health if he has yet received a satisfactory report from the Croydon Corporation regarding the progress of the Beddington sewage scheme; if not, would he make full investigation into this matter and take the necessary steps to relieve the Croydon Corporation of this duty and end the foul smells which were a menace to the health of the citizens of Croydon.—Sir HILTON YOUNG replied: The Croydon Corporation have recently furnished me with a report which shows that satisfactory progress is being made in this matter. A scheme for further remedial works will shortly be submitted to me.

Garden Cities and Satellite Towns

Sir F. FREMANTLE asked the Minister of Health if he had received the report of the committee reappointed in 1931 on garden cities and satellite towns; and, if so, when the report would be published.—Sir HILTON YOUNG replied: This report has been received and instructions have been given for its publication.

Local Authorities and Medical Practitioners' Union

Mr. HALL-CAINE asked the Minister of Health whether any local authorities had yet asked for his advice in regard to the request of the Medical Practitioners' Union that local authorities should give their organisation recognition; and, if so, what advice they had been given.—Sir HILTON YOUNG replied: I have received a communication from one local authority on this subject. I do not consider that it is a matter on which it is properly my function to give advice.

Water-supplies

Mr. CHORLTON asked the Minister of Health when the new committee for the ascertainment of all the sources of water-supply in the country would be appointed; how many technical people it would have on it; and if the terms of reference would be broad enough to enable recommendations of allocation to be made.—Sir HILTON YOUNG replied: The membership of the committee will be announced very shortly. Five of the members will be scientists or engineers. The object of the survey is to collect and to correlate reliable records of available supplies, surface and underground. It will not be within the functions of the committee to make recommendations of allocation, for which additional information, of other kinds, is required.

Smoke Abatement

Mr. RHYS DAVIES asked the Minister of Health whether he was aware of the feeling among some local authorities that progress towards the elimination of domestic smoke was too slow; and whether, as a step in this connexion,

he would consider, as a condition of future housing subsidies, laying down restrictions for the elimination of domestic smoke.—Sir HILTON YOUNG replied: I have received representations from some local authorities on this subject. I do not think it would be practicable to adopt the suggestion made in the second part of the question.

Improvement of Milk-supply

Mr. HALL-CAINE asked the Minister of Agriculture when it was anticipated the Government's scheme to improve the standard of the milk-supply in this country by accredited herds was likely to come into force.

Colonel ROPNER asked the Minister of Agriculture whether arrangements had yet been made to bring into force the scheme for giving special benefits to the producers of clean milk in this country; and whether he was yet in a position to make any statement.—Mr. ELLIOT replied: The Government's Attested Herds Scheme as already announced comes into operation to-morrow. A further scheme, generally known as the Accredited Producers Scheme, has been framed and put forward by the Milk Marketing Board. This is not, however, a scheme of the Government. I am not in a position to make any statement regarding this scheme except that I understand that discussions are proceeding between the Board and the representatives of local authorities.

Unqualified Practitioners and Deafness

Sir FRANCIS FREMANTLE asked the Minister of Health whether he was aware that a number of persons, having no suitable qualifications, were posing as specialists and purporting to treat and cure deafness and head-noises, and that many persons suffering from such afflictions were being put to loss and possibly physical damage by the treatment given by these unqualified practitioners; and whether he would protect those who were deaf from exploitation by unqualified persons pretending to treat and cure deafness.—Sir HILTON YOUNG replied: I am aware of the facts stated in the first part of the question. They are discussed in Dr. Eichholz's report on the Deaf in England and Wales. I have no power to take such steps as are suggested in the last part of the question, but I understand that the National Institute for the Deaf are always prepared to advise those who are deaf on suitable aids to hearing.

Poor-Law Relief in Scotland

Mr. NEIL MACLEAN asked the Secretary of State for Scotland the total cost of poor-law relief in Scotland on Dec. 15th or nearest convenient date, in the following years: 1932, 1933, and 1934.—Mr. SKELTON (Under-Secretary of State for Scotland) replied: The total cost of poor relief can only be given for the financial years 1932–33 and 1933–34, as the statements of expenditure with regard to the relief of the ordinary poor are received by the Department only in respect of each financial year. For the years 1932–33 and 1933–34, the total expenditure, and the average weekly expenditure, on the relief of sane poor of all classes (able-bodied, ordinary and indoor) was as follows:—

Year ending May 15th.	Total cost.	Average weekly cost.
1933	£4,676,800	£89,938
1934	£5,437,280	£104,563

The amount of outdoor relief paid to destitute able-bodied unemployed persons for the week including Dec. 15th in each of the years mentioned was as follows: 1932, £28,313; 1933, £36,723; 1934, £50,866.

MONDAY, FEB. 4TH

Lead Poisoning among Women in the Potteries

Major HILLS asked the Home Secretary whether his attention had been drawn to the increase of cases of lead poisoning among women in the Potteries; and, in view of the fact that these instances were not confined to one or two factories but were distributed over the district and that four of the cases occurring in 1934 were those of young women aged from 19 to 22 years who had been employed for only a few months, would he cause inquiries to be made as to whether there had been any relaxation in the enforcement of the rules in the potteries involved or what had caused the increase in poisoning.—Sir JOHN GILMOUR replied: During 1934 there were 15 newly reported cases of lead poisoning among women for the pottery industry. This is the highest figure for several years, and the particulars indicate that the rise is due to a boom in the manufacture of coloured tiles. This has led to the starting of new works where neither the managements nor the workers have had experience of the high standard of cleanliness necessary. Attention was drawn to the matter in the Chief Inspector's Report for 1933, page 18, and so far from relaxing vigilance the inspectors have been devoting special attention to securing improved standards of care.

Carriage of Dangerous Acids by Road

Major HILLS asked the Home Secretary whether the revised regulations for the carriage of dangerous acids by road had yet been issued.—Sir J. GILMOUR replied: Draft regulations have been prepared dealing with the conveyance by road of corrosive acids, and are at present the subject of consultation with various interests affected. As I have explained in reply to previous questions the matter is one of considerable complexity, but all possible steps are being taken to expedite a decision.

TUESDAY, FEB. 5TH

Supply of Milk to School-children

Mr. ANSTRUTHER-GRAY asked the Secretary of State for Scotland whether any and, if so, which Scottish education authorities were yet operating the new milk-in-schools scheme; and how many children were affected thereby.—Mr. SKELTON, Under-Secretary of State for Scotland, replied: Thirteen education authorities are already operating the scheme. Nearly 200,000 children are receiving milk under it, and that number is expected rapidly to increase.

Protection against Influenza

Dr. McLEAN asked the Secretary of State for Scotland whether there were any arrangements for the public notification of an epidemic of influenza and of the protective measures which should be taken by the public; and, if so, whether he was satisfied that the arrangements were adequate.—Mr. SKELTON replied: In answer to the first part of the question, local authorities from time to time take steps by press notices and otherwise to draw the attention of the public to the existence of an epidemic of influenza and to indicate the precautionary measures which should be taken, and the Department keep themselves informed of the action so taken by local authorities. With regard to the second part, I am considering what, if any, further steps can usefully be taken in the matter.

Medical Opinion and Caning of Girls at School

Mr. TOM SMITH asked the Parliamentary Secretary to the Board of Education whether his attention had been drawn to correspondence with the medical section of his department regarding the caning of girls attending school; and whether he was now prepared to accept the suggestion that an official opinion should be pronounced upon the medical aspect of this question for the guidance of all local education authorities.—Mr. HERWALD RAMSBOTHAM replied: The administration of corporal punishment in the schools is a matter which has always been regarded as within the discretion of the school authorities, and my noble friend does not see any reason to vary this policy. I am satisfied that during recent years there has been a welcome decrease in the infliction of corporal punishment as a means of maintaining discipline. In the case to which the hon. Member refers, the Board regret to learn that the punishment, which consisted of one stroke with a cane on the hand, was inflicted by a male assistant teacher. This action was a direct contravention of the regulations of the authority.

ROYAL MANCHESTER CHILDREN'S HOSPITAL.—An open-air convalescent home for 40 children is being erected in a garden adjoining this hospital. The trustees of the Zachary Merton estate have given £22,000, which will pay for the building, but there is no money available for maintenance, and an appeal for £100,000 for this purpose is being made.

LIVERPOOL VOLUNTARY HOSPITALS

THE COMMISSION'S REPORT

THE commission of inquiry appointed in December, 1933, by the Liverpool General Hospitals Coördination Committee, and the Medical Charities Committee of the Council of Social Service has now brought in its report.[1] It is a document of value not only to those immediately concerned, but also to everyone who cares for the voluntary principle in hospital treatment. The problems discussed are primarily those peculiar to Liverpool itself but they involve and include those wider and larger issues present in every city and more especially every centre of medical teaching.

In Liverpool there are at the present time 20 voluntary hospitals, each an independent unit. Nine of these are engaged in teaching students, four being small general hospitals, and one only having more than 300 beds. These hospitals are scattered throughout the city and, with the exception of the Royal Infirmary, are at some distance from the Medical School. Their buildings are in many instances of considerable age and it is certain that during the coming years if they are to meet the demands of modern medical and surgical science they will be faced with an extensive rebuilding programme. The Commission urges that the opportunity of rebuilding should be utilised to effect a redistribution of accommodation.

With this object the Commission places in the forefront of its recommendations the administrative amalgamation of the four general hospitals. If there is to be any coherent voluntary hospital policy in Liverpool the four general hospitals must be administratively a single thing under the direction of a single government which is free to deal with them in the light of its judgment of the needs of the whole. This would enable a long-range programme to be carried out and the Commission conceives that the aim should be two general hospitals of about 500 beds to replace the four existing buildings. One of these would be an enlarged Royal Infirmary adjacent to the Medical School, the other a new and up-to-date hospital in the suburbs. But the amalgamation of the four general hospitals, vital as this step is for the well-being of the hospitals concerned and essential as the preliminary step, does not deal with the wider interests of the other five teaching hospitals. Some coördinating body is urgently needed for this larger group: a body which can speak with authority on their behalf, in a position to negotiate with the municipality, and to consider the needs and policies of the hospitals it represents. Such a coördinating committee, the Commission thinks, should have an absolute veto on public appeals for extensions by any of the participating hospitals, and a suspensory veto on all capital expenditure. This, in the opinion of the Commission, is the second vital step. It remains to be seen whether the general committees and the honorary staffs of the hospitals concerned will face the implications inherent in this programme. Admittedly some loss of individual sovereignty is implied; but the Commission holds that it is worth while surrendering some part of a lesser individual sovereignty in order to share in a greater collective sovereignty.

The Commission's recommendations are based on the conviction that the voluntary system is worthy of preservation and this vital question receives full consideration in the report. There are those in Liverpool as elsewhere who believe that the disappearance of the voluntary hospital would be a matter of little moment and that a state or municipal service would fulfil adequately and efficiently the functions of the voluntary system. If no satisfactory and convincing case can be made out in their favour then it is futile to waste time and money in an attempt to preserve them; far wiser to hand them over—lock, stock, and barrel—to the municipal authorities and leave the Medical School to make the best terms it can with the city. But this is not the opinion of the Commission, which holds strongly that it is in the interests of the city, the university, and the medical profession alike that the voluntary hospitals should be maintained in full efficiency. These hospitals, they believe, are in accord with the national feeling and genius. "They are the great vitalising influence which irradiates and uniforms the whole world of medicine in this country and the whole field of human endeavour that has for its object the alleviation of sickness and suffering." On the curative, as distinct from the preventive side, they play a part beyond all comparison more important than any other organisation in the country. The concentration of medical talent, the traditions of their service, their methods of government, and the principles controlling the election and promotion of their honorary staffs, together, give them a unique standing in relation to the training of medical students and to research. If this voluntary system is to be maintained it is, in the opinion of the Commission, vital that some working arrangement should be come to with the municipality. In this working arrangement the municipal system should be complementary to rather than competitive with the voluntary system; the ultimate goal must be coöperation, not competition.

[1] Liverpool Hospitals Commission. Report on the Voluntary Hospitals of Liverpool. University Press of Liverpool. London: Hodder and Stoughton, Ltd. 1935. 1s.

INLAND WATER SURVEY FOR GREAT BRITAIN

The Minister of Health and the Secretary of State for Scotland have appointed a committee to advise on the Inland Water Survey for Great Britain, their object being not to appoint representatives of organisations or interests, but to obtain a body of men of different experience. The chairman, Sir Henry Lyons, F.R.S., has been director of the geological survey and of the survey department in Egypt, and director of the Meteorological Office, and is now treasurer of the Royal Society. Sir Clement Hindley is a member of the advisory council of the Department of Scientific and Industrial Research and a member of the council of the Institution of Civil Engineers. Prof. W. S. Boulton is a leading geologist and is now emeritus professor at Birmingham University. Sir Charles Bird, Mr. D. Paul, and Lieut.-Colonel F. Hibbert have had extensive experience of water-supplies and are, respectively chairman of the water committee of the Cardiff corporation, chairman of the Falkirk and District Water Board, and water engineer of the Liverpool corporation. Mr. G. Dallas and Mr. G. J. Griffiths are experienced in the work of catchment and conservancy boards, the former being chairman of the Nene Catchment Board and the latter chief engineer of the Thames Conservancy Board. Mr. W. A. Millar, who is a member of the firm of Messrs. McClure Naismith Brodie and Co., Writers, Glasgow, and secretary of the Scottish Steel Makers' Association, and Mr. B. Verity, who is estates manager of the Calico Printers Association are experienced in questions of water-supply for industrial purposes; and Mr. S. R. Hobday is chairman this year of the Canal Association and is clerk and general manager of the Lee Conservancy Board. The secretary to the committee is Mr. I. F. Armer, M.C., and any communications relating to the work of the committee should be addressed to him at the Ministry of Health, Whitehall, S.W.1.

MEDICAL NEWS

Royal College of Physicians of London

At a meeting of the College held on Jan. 31st, Lord Dawson of Penn, the president, reported on the work being done by the various research scholars on behalf of trusts, with the administration of which the College is concerned: for the Prophit trust by Colonel Maddock, Dr. Ridehalgh, and Dr. Bousfield, for the Leverhulme trust, by Dr. Janet Vaughan, for the Streatfeild trust, by Dr. Jacobs and Mr. Griffiths, and for the Mackenzie-Mackinnon trust, by Dr. Bywaters and Dr. Bousfield.

Dr. Rupert Waterhouse was re-elected a representative of the College on the council of the British Health Resorts Association, and Dr. Arthur Shadwell on the council of the Queen's Institute for District Nursing. Prof. W. W. Jameson was appointed delegate of the College at the seventh imperial social hygiene congress to be held at the London School of Hygiene and Tropical Medicine (July 8th to 12th); Dr. J. A. Charles delegate at the forty-sixth health congress and exhibition of the Royal Sanitary Institute at Bournemouth (July 15th to 20th); and Dr. James Fenton delegate at the annual congress of the Royal Institute of Public Health and the Institute of Hygiene at Harrogate (June 4th to 9th).

The Milroy lectures on infection and its control in children's wards will be delivered by Dr. E. H. R. Harries on Feb. 28th and March 5th; the Goulstonian lectures on respiratory failure, including so-called asphyxia neonatorum by Dr. Alan A. Moncrieff on March 7th, 12th, and 14th; the Lumleian lectures on the evolution of mind, by Dr. J. Shaw Bolton on March 19th and 21st; and the Oliver-Sharpey lectures on the biochemical basis of thyroid function, by Prof. C. R. Harington, F.R.S., on March 26th and 28th. All the lectures will take place at 5 P.M. at the College, Pall Mall East, S.W.

The following candidates, having satisfied the censors' board, were admitted members of the College:—

Stanley Alstead, M.D. Liverp., Harry Rumbold Bathurst Norman, M.B. Oxon, Richard Raymond Bomford, M.B. Oxon, Wilfrid Dykes Bower, L.R.C.P., Rupert Briercliffe, M.B. Manch., Doris Elizabeth Bunbury, M.B. Lond., Cyril Astley Clarke, M.B. Camb., John Lionel Hayward, M.B. Adelaide, Charles Laurence Heanley, L.R.C.P., Frederick Joseph Victor Jaensch, L.R.C.P., Russell David King, M.D. N.Z., Rosalind Brackenbury Latter, M.B.N.Z., Philip Leftwich, L.R.C.P., Austin William Drevar Leishman, M.B. Oxon, John Ernest Seton Lloyd, M.B. Liverp., Thomas Edward Lowe, M.B. Melb., Robert John Stewart McDowall, M.B. Edin., George Harper Pearce, M.D. Durh., Gordon Arthur Ransome, L.R.C.P., Frederic Gardiner Rose, M.D. Camb., Dhirendranath Sanyal, M.B. Lucknow, Victor Emmanuel Perera Senewiratne, M.B. Lond., James Alexander Smeal, M.B. Melb., George Geoffrey Evanson Smyth, M.B. Manch., Cicely Delphine Williams, M.B. Oxon, Roland Francis Wilson, M.B. N.Z., Albertine Louise Winner, M.D. Lond.

Licences to practise were conferred upon 121 candidates (113 men and 8 women) who have passed the final examination of the Conjoint Board and have complied with the by-laws. The following are the names and medical schools of the successful candidates:—

J. Adler, West Lond. and Charing Cross; A. G. V. Aldridge Camb. and Birm.; C. Anderson, St. Bart.'s; D. E. W. Anderson, Lond.; H. R. Arthur, St. Thomas's; R. A. J. Asher, Lond.; S. H. Awad, Johns Hopkins and Univ. Coll.; G. T. Balean, Guy's; D. S. D. Barber, St. Bart.'s; R. Bevan, Oxon and St. Thomas's; Brenda G. Billings, Roy. Free; G. Blackburn, Camb. and St. Bart.'s; G. L. Bohn, St. Bart.'s; A. P. Booth, Lond.; B. B. Botha, St. Bart.'s; H. S. Brodribb, Oxon and St. Bart.'s; S. G. Brook, Camb. and St. Thomas's; R. Bruce, King's Coll.; A. F. Bryson, Camb. and Lond.; C. Campbell, Univ. Coll.; A. H. Casson, St. Bart.'s; W. E. Clarke, Charing Cross; W. B. Clegg, Guy's; M. C. Condillac, Madras and Westminster; E. C. Cordeaux, Middlesex; P. E. Cresswell, Oxon and Guy's; E. R. Dansie, King's Coll.; J. E. Darlow, Guy's; A. J. S. De Freitas, St. Bart.'s; Shanti Devi, Punjab and West Lond.; H. K. Doctor, Bombay and St. George's; A. J. Dubinsky, St. Mary's; F. C. Durbin, St. Thomas's; G. B. Ebbage, Guy's; D. M. Evans, St. Bart.'s; W. J. Finegold, Charing Cross; J. R. Forbes, Guy's; Mercia Force-Jones, West Lond.; C. E. Garson, Madras and West Lond.; J. Geller, Westminster; J. E. Giesen, Guy's; P. Glazer, King's Coll.; Muriel C. Goodchild, Roy. Free; J. L. Gordon, Middlesex; S. A. Greenwood-Penny, St. George's; P. Grugeon, King's Coll.; W. E. Hadden, St. Thomas's; J. T. Hallett, Camb. and St. Thomas's; J. P. Harrison, Lond.; R. V. Havard, Cardiff and Univ. Coll.; G. W. Hayward, St. Bart.'s; G. W. Hearn, St. Thomas's; P. A. M. Heath, Birm. and Durh.; J. C. Henry, Guy's; T. C. Henry, Middlesex; H. F. G. Hensel, Lond.; K. F. W. Hinson, St. Mary's; J. Holden, Leeds; K. Hooper, Guy's; D. A. B. Hopkin, St. Mary's; P. W. Houghton, St. Bart.'s; C. Houghton Brown, St. George's; H. T. J. Hynes, St. Bart.'s; J. E. Ives, Camb. and Univ. Coll.; W. H. Jones, Camb. and Univ. Coll.; M. R. Kark, Cape and Guy's; G. H. W. Keates, Guy's; A. H. Khan, Bombay and Birm.; E. H. Kitching, Leeds; A. H. A. Kol, Univ. Coll.; F. B. Lake, Guy's; F. H. Lamb, St. Thomas's; W. S. Larcombe, Guy's; W. A. Law, Camb. and Lond.; M. Lederman, Westminster; J. Lees, St. Thomas's and Manch.; W. Libertson, St. Bart.'s; J. F. Lockwood, Guy's; H. M. McGladdery, St. Bart.'s; Margaret I. McHaffie, Roy. Free; W. N. Mann, Guy's; A. T. Marrable, St. Thomas's; J. Marshall, Lond.; A. B. G. Mein, Westminster; S. G. Mohler, St. Mary's; R. S. Morris, Camb. and St. Thomas's; Anisa Nagi, Roy. Free and West Lond.; D. F. E. Nash, St. Bart.'s; A. Pearlman, Middlesex; A. L. Peers, Camb. and Guy's; F. R. Pepper, Oxon and St. Thomas's; A. D. Popat, Bombay and Lond.; T. S. Protheroe, Guy's; S. Ramgoolam, Univ. Coll.; Cecilia E. M. Rath, Punjab and Roy. Free; Eileen G. Rose, Leeds; C. G. Roworth, Univ. Coll.; J. K. Samuel, St. Thomas's; S. V. Sansom, St. Bart.'s; H. Silman, Leeds; J. Simon, Lond.; B. N. Sinha, Lucknow and Middlesex; I. Slome, Cape and Lond.; J. A. H. Smart, King's Coll.; G. G. Smith, St. Thomas's; J. H. E. Summerhill, Univ. Coll.; E. W. Tapley, Manch.; R. H. Taylor, Camb. and St. Mary's; C. Tetlow, Manch.; B. M. Truscott, Middlesex; J. E. G. Vincenzi, St. Thomas's; M. M. Waldman, Westminster; W. T. H. Wales, Cardiff; H. J. Wallace, Camb. and St. Thomas's; H. Waterman, Leeds; J. D. S. Watling, Univ. Coll.; E. T. Weekley, Camb. and St. Thomas's; G. Williams, Camb. and St. George's; J. G. Williams, Westminster; A. R. Yates, Lond.; and J. G. Youngman, St. Bart.'s.

Diplomas were conferred jointly with the Royal College of Surgeons upon the following candidates:—

Diploma in Public Health.—J. M. L. Burtenshaw, J. C. Chukerbuti, J. R. Godsall, D. B. Kulkarni, Louise A. Matheson, H. R. Paterson, A. Ryder-Lewis, M. A. B. Sabery, and G. L. Stroud.

Diploma in Medical Radiology.—R. G. Hutchison.

The names of those granted diplomas in psychological medicine, tropical medicine and hygiene, and laryngology and otology were given on p. 182 of our issue of Jan. 19th.

University of Oxford

Candidates for the Francis Gotch memorial prize are invited to send their names and qualifications by Feb. 16th to the Board of Management, Department of Physiology, Oxford. The examination will take place on Feb. 23rd. Preference will be given to candidates showing proficiency in biochemistry.

Dr. E. W. Ainley Walker has been appointed to carry on the duties of the professorship of pathology during Hilary term.

Society of Apothecaries of London

The Gillson scholarship in pathology of this society has been awarded to Dr. Frank Hawking.

Sir Alfred Fripp Memorial Fellowship

Dr. R. A. Q. Lay has been appointed to this fellowship in child psychology for the coming two years in succession to Dr. C. H. Rogerson who has been appointed to a Rockefeller travelling fellowship.

Medical Superintendents' Society

The annual dinner of this society will be held at the Langham Hotel, Portland-place, London, W., at 7.30 P.M., on Saturday, March 23rd. The hon. secretary is Dr. C. D. Agassiz, Archway Hospital, N.19.

London School of Hygiene and Tropical Medicine

The board of management of the school has appointed Sir Cooper Perry to be its chairman for the year 1935. Mr. G. R. Oake, B.A., at present on the administrative staff of the University of London at South Kensington has been appointed secretary of the school as from Oct. 1st next.

Royal Society of Arts

Three lectures on factory accidents will be given under the Shaw Trust on Mondays, Feb. 25th, and March 4th and 11th at 8 P.M. Mr. D. R. Wilson, chief inspector of factories, will discuss the prevalence, distribution, and causation of accidents in the first lecture, and in the second Mr. G. Stevenson, deputy chief inspector of factories will consider their principal causes. Mr. Leonard Ward, deputy chief inspector of factories, in the last lecture will describe measures for their prevention. The meetings will be held in the house of the Society of Arts, John-street, London, W.C.

THE prize of £15 offered by the *British Journal of Anæsthesia* for the best essay sent in on any subject directly connected with the physiology or practice of anæsthetics has been awarded to Dr. Wesley Bourne and Dr. B. R. Raginsky, of McGill University, Montreal. The title of their essay is Vinyl Ether (Vinesthene) Anæsthesia in Dogs, and it is published in the current number of the journal.

Clinic at Droitwich

Mrs. Stanley Baldwin has opened an infant welfare clinic at Droitwich.

British Voluntary Hospitals Association

A branch of this association to cover the whole of Sussex has been formed.

Society of Chemical Industry

The food group of this society will hold a meeting at the London School of Hygiene and Tropical Medicine, Keppel-street, W.C., on Wednesday, Feb. 13th, at 8 P.M., when Mr. H. B. Cronshaw, Ph.D., will open a discussion on the training of the food technologist.

Institute of Medical Psychology

Following its recognition by the University of London, as an approved clinic in connexion with the post-graduate diploma in psychology, the Institute has arranged a course of 11 lectures on mental health in childhood. The lectures form part of a clinical course for the university's academic diploma in psychology.

Royal Sanitary Institute

At a sessional meeting of the institute which is to be held in the Municipal Buildings, Plymouth, on Friday, Feb. 22nd, at 5.15 P.M., a discussion on the examination of tinned foods will be opened by Dr. W. S. Walton, deputy medical officer of health of Plymouth. Dr. J. L. Dunlop, deputy medical officer of health to the Devon county council, will open a discussion on legislative control of milk-supplies. The hon. local secretary is Dr. T. Peirson, Town Hall, Stonehouse, Plymouth.

Willesden Clinic Luncheon

Princess Louise is patron of a luncheon to be given in aid of the Willesden (V.A.D.) Special Surgery Clinic and Physical Treatment Centre on Thursday, Feb. 14th, at the Hotel Belgravia, Grosvenor-gardens, London, S.W. Among the speakers will be Dr. W. J. O'Donovan and Dr. T. Pearse Williams.

Applications for tickets should be made to Mrs. Aubrey Richardson, 159, Willesden-lane, N.W.6.

The Chadwick Gold Medal

On Monday, Feb. 18th, at 5 P.M., in the lecture hall of Manson House, the Director-General Army Medical Service will present Colonel W. P. Macarthur to Sir William Collins, chairman of the Chadwick Trustees, for the Chadwick gold medal and prize. This prize is awarded once in five years to the medical officer of the Navy, Army or Air Force who has most distinguished himself during that period in promoting the health of the men of the service to which he belongs. The last award was made in 1930 to Surgeon-Captain Sheldon Dudley, R.N., and among previous recipients are Sir William Horrocks and Sir Wilfred Beveridge. Following the presentation Dr. W. A. Robson will give a discourse on A Hundred Years of Public Health Administration.

University of Durham

Mr. R. J. Willan, lecturer in surgery at the Newcastle College of Medicine, has been appointed to the chair of surgery in succession to Prof. Grey Turner.

Robert Joseph Willan was born in 1878 and was educated at Durham School and at Durham University, from which he graduated in 1906. He obtained the F.R.C.S. Eng. in 1908 and the following year the M.S. Durh. with first-class honours. He held house appointments at the Royal Victoria Infirmary, Newcastle, under Prof. Rutherford Morison, and later at St. Peter's Hospital for Stone in London. In 1911 he was appointed demonstrator in surgical pathology at the College, and in 1914 lecturer in clinical surgery: also in 1914 he joined the honorary staff of the Royal Victoria Hospital as assistant surgeon, becoming surgeon in 1920. During the war he served with the Royal Naval Volunteer Reserve, and as principal medical officer of that service from 1930 till 1933 he was hon. surgeon to the King. He retired in 1933 with the rank of surgeon-captain. In 1915 he received the M.V.O. and in 1919 the O.B.E. His contributions to medical literature include many on urological surgery.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, Feb. 12th.
Therapeutics and Pharmacology. 5 P.M. Dr. V. Korenchevsky and Mrs. M. Dennison: Manifold Effects of Testicular Hormones and of Œstrone on the Male as judged by Experiments on Rats. Dr. A. C. Crooke and Dr. V. Korenchevsky: Microscopic Demonstrations of Hypophyses of Male Rats, Normal, Castrated, and after Œstrone Injections. Prof. C. S. Hicks (Adelaide): (*a*) The Treatment of Two Cases of Addison's Disease. (*b*) The Effect of Prolan on Metabolism, in a case of Simmond's Cachexia.
Psychiatry. 8.30 P.M. Dr. Edward G. Glover: The Application of Psychoanalytic Principles in Psychiatry.
FRIDAY.
Physical Medicine. 5 P.M. Dr. E. P. Cumberbatch: Fulguration (Electro-desiccation). Dr. Philippe Bauwens: The Treatment of Chronic Inflammatory Ulcers by Electrolysis.
Obstetrics and Gynæcology. 8 P.M. (With the Eugenics Society), Mr. Victor Lack, Dr. C. P. Blacker, Mr. Cecil Binney, and Dr. V. B. Green-Armytage: Sterilisation of Women.
Radiology. 8.15 P.M. Dr. Russell J. Reynolds: X Ray Cinematography.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.
MONDAY, Feb. 11th.—8.30 P.M., Dr. Robert Hutchison and Dr. H. Gardiner-Hill: Body Weight in Relation to Disease.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.
THURSDAY, Feb. 14th.—8.30 P.M. (11, Chandos-street, W.), Dr. C. W. J. Brasher: The Pragmatic Value of Individual Psychology.

PADDINGTON MEDICAL SOCIETY.
TUESDAY, Feb. 12th.—9 P.M. (Great Western Royal Hotel, W.), Rev. C. C. Martindale: Medico-Religious Problems—a General Survey.

SOUTH-WEST LONDON MEDICAL SOCIETY.
WEDNESDAY, Feb. 13th.—9 P.M. (Bolingbroke Hospital, Bolingbroke-grove, Wandsworth Common), Dr. Donald Paterson: So-called Acidosis Attacks.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY, Stepney Green, E.
THURSDAY, Feb. 14th.—3 P.M., Clinical Meeting.

BIOCHEMICAL SOCIETY.
FRIDAY, Feb. 15th.—4 P.M. (London School of Hygiene and Tropical Medicine, Keppel-street, W.C.), Short Communications.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C. (Arris and Gale lectures.)
MONDAY, Feb. 11th, and WEDNESDAY and FRIDAY.—5 P.M., Dr. John Beattie: The Anatomy and Physiology of the Hypothalamus.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Feb. 11th, to SATURDAY, Feb. 16th.—MEDICAL SOCIETY OF LONDON, Chandos-street, W., Frid., 4.15 P.M., Dr. A. E. Clark-Kennedy: Jaundice.—BROMPTON HOSPITAL, S.W. All day course in diseases of the chest.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. All day course in gynæcology.—ST. JOHN'S HOSPITAL, Leicester-square, W.C., Afternoon course in dermatology. (Open to all.)—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues., 8 P.M., Mr. A. E. Porritt: Intestinal Obstruction. Thurs., 8 P.M., Mr. E. W. Riches: Bladder and Kidney.—WELLCOME MUSEUM OF MEDICAL SCIENCE, Euston-road, N.W. Thurs., 3 P.M., Dr. S. H. Daukes: Helminthology as it affects the Clinician.—Courses, clinics, &c. arranged by the Fellowship are open only to members and associates.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Feb. 11th.—10 A.M., skin clinic and medical wards. 2 P.M., gynæcological and surgical wards, eye and gynæcological clinics. 4.15 P.M., Mr. N. F. Sinclair: Surgery of the Gall-bladder.
TUESDAY.—10 A.M., medical wards. 11 A.M., surgical wards. 2 P.M., throat clinic. 4.15 P.M., Mr. Hamblen Thomas: Mastoiditis.
WEDNESDAY.—10 A.M., children's ward and clinic. 2 P.M., eye clinic and medical wards. 4.15 P.M., Mr. Gibb: Demonstration of Eye Cases.
THURSDAY.—10 A.M., neurological and gynæcological clinics. 11.30 A.M., fracture demonstration. 2 P.M., eye and genito-urinary clinics.
FRIDAY.—10 A.M., skin clinic. Noon, lecture on treatment. 2 P.M., throat clinic. 4.15 P.M., Dr. Redvers Ironside: Cerebral Symptoms and their Detection.
SATURDAY.—10 A.M., medical wards, children's and surgical clinics. Daily at 2 P.M., operations, medical and surgical clinics.
The lectures at 4.15 P.M. are open to all medical practitioners without fee.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
MONDAY, Feb. 11th.—Noon, Dr. W. W. Payne: Tests of Gastric Function.
WEDNESDAY.—2 P.M., Mr. J. Crooks: Sinus Disease in Childhood.
THURSDAY.—Noon, Dr. D. Nabarro: Congenital Syphilis. 4. Prevention and Treatment.
FRIDAY.—Noon, Dr. A. Signy: Aids in Diagnosis of Poliomyelitis.
There will be out-patient clinics every day at 10 A.M. and ward visits (except on Wednesday) at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Feb. 11th.—3.30 P.M., Dr. Kinnier Wilson: Congenital Diseases of the Nervous System.
TUESDAY.—3.30 P.M., Dr. Grainger Stewart: Compression Paraplegia.
WEDNESDAY.—3.30 P.M., Dr. James Collier: Clinical Demonstration.
THURSDAY.—3.30 P.M., Dr. Kinnier Wilson: Congenital Diseases of the Nervous System.
FRIDAY.—3.30 P.M., Dr. James Collier: Polyneuritis.
Out-patient clinic daily at 2 P.M.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
MONDAY, Feb. 11th, to FRIDAY.—12.30 P.M., Course in Methods of Examination and Diagnosis.
FRIDAY.—4 P.M., Mr. C. Gill-Carey: Simple and Malignant Growths of the Larynx.

CANCER HOSPITAL (FREE), Fulham-road, S.W.
THURSDAY, Feb. 14th.—4 P.M., Dr. C. C. Worster-Drought: Cerebral Tumour.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Feb. 14th.—9 P.M., Mr. John B. Hunter: Gall-stones.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION St. James' Hospital, Ouseley-road, S.W.
WEDNESDAY, Feb. 13th.—4 P.M., Dr. A. J. Wrigley: The Obstetric Forceps.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.
WEDNESDAY, Feb. 13th.—4 P.M., Mr. A. Gray: Some Aspects of Sterility.

LONDON SCHOOL OF DERMATOLOGY, 49, Leicester-square, W.C.
TUESDAY, Feb. 12th.—5 P.M., Dr. H. T. Barron: Common Skin Diseases in Childhood.
WEDNESDAY.—5 P.M., Dr. I. Muende: Histopathology of some Common Skin Diseases.
THURSDAY.—5 P.M., Dr. J. L. Franklin: Bullous Eruptions of the Skin.

UNIVERSITY OF LONDON.
MONDAY, Feb. 11th.—5 P.M. (University College, Gower-street, W.C.), Mr. H. R. Ing: Chemical Structure and Pharmacological Action. (First of six lectures.)

GENERAL HOSPITAL, Newcastle.
SUNDAY, Feb. 10th.—10.30 A.M., Dr. F. J. Nattrass: Medical Ward Visit.

PUBLIC DISPENSARY AND HOSPITAL, Leeds.
WEDNESDAY, Feb. 13th.—4 P.M., Dr. S. J. Hartfall: Diagnosis and Treatment of Organic Dyspepsia.

GENERAL INFIRMARY, Leeds.
TUESDAY, Feb. 12th.—3.30 P.M., Mr. Pain: Scoliosis.

GLASGOW POST-GRADUATE ASSOCIATION.
TUESDAY, Feb. 12th (Faculty Hall, 242, St. Vincent-street), Dr. Stanley Graham: Prognosis of Pulmonary Diseases of Children.
WEDNESDAY.—4.15 P.M. (Royal Samaritan Hospital for Women), Mr. Matthew White: Surgical Cases.

Births, Marriages, and Deaths

BIRTHS

SCOTT.—On Jan. 30th, at Newbury, the wife of T. G. Scott, F.R.C.S. Edin., of a daughter.

TUCKETT.—On Jan. 30th, at Tonbridge, the wife of Cedric Tuckett, M.Ch. Camb., F.R.C.S. Eng., of a daughter.

MARRIAGES

MORTON—HIGSON.—On Jan. 29th, at The Old Church, St. Lawrence, I.O.W., Philip Morton, B.M. Oxon., D.P.H., of Leek, Staffs, to Mary Margaret Russell, elder daughter of Dr. and Mrs. J. Russell Higson, of Honor Oak Park, S.E.

DEATHS

LANCASTER.—On Feb. 1st, Henry Francis Lancaster, M.D. Brux., M.R.C.S. Eng., Captain, R.A.M.C. (T.) (retired), of Gloucester-terrace, W., Consulting Anæsthetist to Guy's Hospital, aged 81.

MORTON.—On Feb. 5th (suddenly, from pneumonia), James Robert Morton, M.B. Lond., of The Lodge, Southbourne-road, Southbourne, Bournemouth. Cremation private.

ROMER.—On Jan. 30th, at Park Spinney, Stanmore, Robert Leslie Romer, O.B.E., M.R.C.S. Eng., L.S.A., in his 70th year.

THOMPSON.—On Feb. 3rd, suddenly, at Longfield, Great Missenden, Bucks, Harold Theodore Thompson, M.D. Camb., F.R.C.P. Lond., F.R.C.S. Eng., of Portland-place, W.

THOMSON.—On Jan. 29th, at 9, Headland Park, Plymouth, Eustace Boase Thomson, M.D. Glas., in his 89th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births Marriages, and Deaths.

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Infirmary.—Med. Supt. £800.
Aberdeen, Woodend (Municipal) General Hospital.—Jun. Res. M.O. £100.
Bath, Royal United Hospital.—Hon. Asst. Physician. Also H.S. At rate of £150.
Benenden, National Sanatorium.—Med. Supt. £600.
Birkenhead General Hospital.—Sen. H.S. At rate of £150. Also Second H.S., H.P., and Cas. O. Each at rate of £100.
Birkenhead Municipal Hospital.—Res. M.O. £300.
Birmingham Children's Hospital.—Asst. Res. M.O. and Asst. Pathologist. £125.
Bootle General Hospital.—H.P., Two H.S.'s, and Cas. O. Each at rate of £150.
Bournemouth, St. Ann's, Canford Cliffs.—Visiting Physician. £200.
Brighton, New Sussex Hospital for Women.—H.S. £100.
Bristol University.—Lecturership in Pathology.
Cambridge.—Three Tancred's Studentships. Each £100.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Canterbury, Kent and Canterbury Hospital.—H.P. At rate of £125.
Cape Town University.—Jun. Asst. in Bacteriology. £375.
Carlisle, Cumberland Infirmary.—Second H.S. Also H.S. to Spec. Dept. Each at rate of £155.
Charing Cross Hospital, Strand, W.C.—Surg. Reg. and Med. Reg. Each £150. Also Med. Reg. (part-time). £50.
Charing Cross Hospital Medical School, Chandos-street, W.C.—Lecturer in Hygiene and Public Health.
Derby, Walton Sanatorium, near Chesterfield.—Sen. Res. Asst. M.O. £450.
Doncaster Royal Infirmary.—H.S. £175.
Fareham, Hants, Knowle Mental Hospital.—Jun. Asst. M.O. £350.
Gordon Hospital for Fistula, Vauxhall Bridge-road, S.W.—Hon. Asst. Surgeon.
Halifax Hospital for Infectious Diseases.—Res. M.O. £350.
Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—Cas. Surg. O. for Out-patients' Dept. At rate of £100.
Hospital for Sick Children, Great Ormond-street, W.C.—Sebag-Montefiore Fellowship. £500.
Hove General Hospital.—Hon. Anæsthetist.
Hull Royal Infirmary.—H.S. to Ophthalmic, Ear, Nose, and Throat Depts. At rate of £150.
Ipswich Mental Hospital.—H.P. At rate of £75.
Leeds Public Dispensary and Hospital.—Jun. Res. M.O. £150.
Liverpool and District Hospital for Diseases of the Heart.—H.P. At rate of £100.
Liverpool Royal Southern Hospital.—Medical Tutor and Registrar. £175.
London Homœopathic Hospital, Great Ormond-street, W.C.—Res. M.O. £100.
London University.—University Readership in Morbid Anatomy. £800. Also Studentship in Physiology. £100.
Manchester Babies' Hospital, Levenshulme.—Sen. Res. M.O. At rate of £125.
Manchester, Booth Hall Hospital.—Res. Surg. O. £400. Also Two Jun. Asst. M.O.'s. Each at rate of £200.
Manchester, Christie Hospital and Holt Radium Institute, Withington.—Res. M.O. At rate of £150.
Manchester, Withington Hospital and Institution.—Jun. Asst. M.O. At rate of £200.
Metropolitan Hospital, Kingsland-road, E.—Ophth. Surg.
Middlesex County Council.—Physicians, Surgeons, and Obstet. Surgeons, Grade I. £1000. Grade II., £650.
Miller General Hospital.—H.P. and H.S. Each at rate of £100.
Newcastle-upon-Tyne, Barrasford Sanatorium.—Res. Med. Asst. £250.
Newcastle-upon-Tyne Eye Hospital.—Sen. Res. H.S. £300.
Northampton General Hospital.—Hon. Surgeon.
Nottingham Children's Hospital.—Res. H.S. At rate of £150.
Plymouth, Prince of Wales's Hospital.—H.S. At rate of £120.
Preston, Sharoe Green Hospital.—Jun. Asst. Res. M.O. At rate of £100.
Princess Beatrice Hospital, Earl's Court, S.W.—Hon. (Additional) Radiologist. Also Res. M.O. At rate of £150.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Hon. Anæsthetists.
Queen's Hospital for Children, Hackney-road, E.—H.P. and Two Cas. O.'s. Each at rate of £100.
Romford Institution and Hospital, &c.—Medical Supt. £1000.
Royal Naval Medical Service.—Ten M.O.'s.
St. Albans and Mid-Herts Hospital and Dispensary.—Res. H.S. £150.
St. Bartholomew's Hospital, E.C.—Dental H.S. At rate of £80.
St. Mary's Hospital, W.—Physician to Out-patients.
St. Thomas's Hospital Medical School, S.E.—Lecturer and Deputy-Director in Anatomy. £600.
Salvation Army, Mother's Hospital, Lower Clapton-road, E.—Jun. Res. M.O. At rate of £80. Also Obstet. Reg. £25.
Scarborough Borough.—School Medical Inspector and Deputy M.O.H. £500.
South Eastern Hospital for Children, Sydenham, S.E.—Jun. Res. M.O. At rate of £100.
Stirling District Mental Hospital, Larbert.—Med. Supt. £1000.
Stoke-on-Trent, London-road Institution.—Three Asst. Res. M.O.'s. Each £250.
Sunderland Royal Infirmary.—Asst. Pathologist. £350.
West End Hospital for Nervous Diseases, Gloucester-gate, N.W.—Hon. Asst. Physician.
Woking and District Victoria Hospital.—Res. M.O. At rate of £120.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at St. Blazey, Cornwall; and Newark, Nottinghamshire.

Notes, Comments, and Abstracts

A NORTHERN SPA HOSPITAL

FOUNDED at Strathpeffer 43 years ago, the Nicolson Mackenzie Memorial Hospital is an example of what may be done at comparatively small expense to bring the benefits of hydrological treatment within the reach of the insured classes and persons of small means generally. From the latest report we learn that in 1933, 93 patients were admitted and treated for various rheumatic complaints. They came not only from the surrounding countryside but also, especially, from the islands of the west—Lewis, Harris, Skye and their neighbours. Residential treatment with the use of sulphur waters and baths is provided at an inclusive cost of £1 6s. per week, but unfortunately the 19 beds are insufficient to supply the needs of all who seek admission. At the time the hospital was founded the ancient thatched cottages of Strathpeffer were rapidly disappearing and the village was becoming a modern spa. The purpose of the founders was to continue the benefits of the spa for the people of the north of Scotland who had frequented it for 100 years, and the help it has given many of them seems to be undoubted. But one could wish that detailed medical reports were presented to show the type of case in which waters of this class are found most beneficial. In the collective treatment of rheumatism at the health resorts it is highly desirable that periodical reports should be made available giving precise data for the cases treated, including measurements and weights. The practice followed in Sweden of stating the results of treatment in percentages of capacity for work on leaving the hospital and six months afterwards might well be followed.

NEW PREPARATIONS

LACTOPEPTINE TABLETS.—We have received a sample of this preparation which was originally put on the market about 40 years ago, when it was favourably noticed in our columns. The present formula under which the remedy is now produced by Products (Beechams) Limited, St. Helens, differs in composition from the tablets as originally devised by additions and modifications dictated by the general expansion during the period of therapeutic knowledge. The published formula now is: lac. siccatus, 21·04; acidum lacticum B.P., 1·39; acidum hydrochlor. B.P., 0·52; sodii saccharinas, 0·26; acidum citricum, 0·83; acidum phosphoricum, 1·49; essentiæ, 1·61; pepsinum, 19·48; pancreatinum, 8·37; lactin, 30·47; diastasum, 5·59; excipients, q.s.; and those interested in therapeutic and pharmaceutical details might compare this formula with that originally published in THE LANCET of August 3rd, 1895. The relief which should follow the use of lactopeptine tablets in cases of indigestion, dyspepsia, and flatulence is indicated by their ingredients.

REDOXON.—In a note on new preparations published in our issue of Jan. 5th, 1935, we called attention to the constitution of this remedy, and on Jan. 12th we published an annotation referring to the manufacture and application of vitamin C. The subject was dealt with in the same issue by Mr. L. J. Harris and Mr. S. N. Ray, and, in commenting on their paper and other literature dealing with vitamin C, we suggested that although active vitamin C had now been synthesised this had not yet occurred on a considerable scale. From the Hoffmann-La Roche Chemical Works Ltd., however, a note has appeared stating that "large quantities of l-ascorbic acid have been manufactured, and we are in a position to offer it to the medical profession for clinical investigations and routine therapeutic use. The preparation is issued in the form of powder or 'Redoxon' brand tablets, each of the latter containing no less than 50 mg. of pure vitamin C. Ampoules will be available shortly."

Appointments

TUCKER, W. ELDON, M.A. Camb., F.R.C.S. Eng., has been appointed Hon. Consulting Orthopædic Surgeon to the Erith, Belvedere, and Abbey Wood Hospital.

St. Mary's Hospitals, Manchester.—The following appointments are announced:—
GERRARD, E. A., M.D. Manch., Obstetric Surgeon;
HUNTER, J. W. A., M.D. Edin., Obstetric Surgeon; and
NEWTON, R., M.D. Manch., Obstetric Surgeon.

Royal Mineral Water Hospital, Bath.—The following appointments are announced:—
BURT, J. BARNES, M.D. Lond., Hon. Physician;
GIBSON, H. J., M.B. Edin., D.P.H., Assistant Pathologist; and
STEVEN, G. D., M.B. Edin., D.P.H., D.M.R., Hon. Radiologist.

London County Council Hospital Staff.—The following appointments, promotions, and transfers are announced. A.M.O. (I.) and (II.) = Assistant Medical Officer, Grades I. and II. Temp. = Temporary.
LESLIE-SPINKS, A. J., B.M. Oxon., A.M.O. (I.), Archway.
O'CONNOR, A. J., M.B. Dubl., D.P.H., A.M.O. (I.), Downs Hospital for Children.
PEARCE, R., M.D. Camb., A.M.O. (I.), St. Mary Abbots.
MAY, A. J., M.B. Melb., M.R.C.P. Lond., A.M.O. (I.), St. Peter's.
FENTON, M. A. B., M.B. Edin., Temp. A.M.O. (I.), St. John's.
HOLMES, S. W., F.R.C.S. Eng., A.M.O. (I.), St. George-in-the-East.
GISSANE, W. C., F.R.C.S. Eng., A.M.O. (I.), St. James'.
CLIFT, F. A., M.R.C.S. Eng., M.C.O.G., A.M.O. (I.), Lambeth.
COCHRANE, H. L., M.B. Belf., A.M.O. (II.), Archway.
COSENTINO, V. F., M.D. Toronto, A.M.O. (II.), Bethnal Green.
PECKHAM, R. B., M.R.C.S. Eng., A.M.O. (II.), City of London Institution.
KAYE, E. B., M.B. Glasg., A.M.O. (II.), Hackney.
GOLDRING, H. J., M.B. Belf., A.M.O. (II.), Lambeth.
SAUNDERS, S. B. H., M.R.C.S. Eng., Temp. A.M.O. (II.), Lewisham.
PEARSON, H. E. S., M.B. Lond., A.M.O. (II.), Lewisham.
SMITH, D. W. G., M.B. Edin., A.M.O. (II.), New End.
COPE, M. E., M.B. Lond., A.M.O. (II.), Mile End.
WILSON, E. R. M., M.B. Glasg., A.M.O. (II.), Norwood.
MCDOWALL, A., M.B. Edin., A.M.O. (II.), Paddington.
WILLIAMS, S. W., M.D. Melb., A.M.O. (II.), Queen Mary's, Sidcup.
SHORTER, A. A., M.B. Sydney, A.M.O. (II.), Queen Mary's, Sidcup.
LENDRUM, C. E. L., M.R.C.S. Eng., A.M.O. (II.), St. Andrew's.
WORCESTER, R. G., M.D. Melb., M.C.O.G., A.M.O. (II.), St. Charles'.
LIDDELL, V. L., M.B. Leeds, A.M.O. (II.), St. Charles'.
FISHER, J. H., M.B. Sydney, A.M.O. (II.), St. George-in-the-East.
KEMP, B. M., M.B. Lond., A.M.O. (II.), St. Giles'.
CHAMINGS, R. E., M.D. Lond., Temp. A.M.O. (II.), St. Giles'.
CROWE, E. V., F.R.C.S. Edin., A.M.O. (II.), St. James'.
NIVEN, E. G., M.R.C.S. Eng., A.M.O. (II.), St. Leonard's.
LYON, M. J., M.B. Sydney, A.M.O. (II.), St. Mary Abbots.
ROBINSON, M. H. B., M.B. Melb., A.M.O. (II.), St. Mary, Islington.
RAMSAY, I. S. W., M.B. Aberd., A.M.O. (II.), St. Olave's.
DEVIN, C. H., M.R.C.S. Eng., A.M.O. (II.), St. Pancras.
DOUGLAS, A. M., M.B. N.Z., A.M.O. (II.), St. Stephen's.
STEWART-HESS, C. H., M.B. Liverp., A.M.O. (II.), St. Stephen's.
HOLLOWAY, R. D., B.A., M.R.C.S. Eng., House Physician, St. James'.
ANNING, R. M. H., M.R.C.S. Eng., House Physician, St. James'.
BELL, G. A., L.M.S.S.A., House Physician, St. Mary Abbots.
FARNCOMBE, R., M.R.C.S. Eng., House Surgeon, St. Mary Abbots.
HOWELL, T. H., M.R.C.S. Eng., House Physician, St. Olave's.
EASTERLING, R. C., M.A., M.R.C.S. Eng., House Physician, St. Olave's.
KAYE, A. M., M.R.C.S. Eng., House Physician, St. Giles'.
MAY, K. S., M.D. Lond., D.L.O., Senior A.M.O. (II.), St. Leonard's.
BREEN, G. E., M.D. Dubl., D.O.M.S., Senior A.M.O. (II.), Northern.
LEWIS, D. L., M.Ch. Camb., F.R.C.S. Eng., Senior A.M.O. (II.), Archway.
GREENFIELD, C. R. M., M.B., A.M.O. (I.), Eastern.

Medical Referee under the Workmen's Compensation Act, 1925: SAMUEL MCMURRAY, M.B., F.R.C.S., of Stoke-on-Trent, for Hanley, Stoke-upon-Trent, Leek, Newcastle-under-Lyme, Stone, Lichfield, Stafford, Tamworth, and Uttoxeter County Court Districts (Circuit No. 26), with a view to his dealing with ophthalmic cases.

Certifying Surgeons under the Factory and Workshop Acts: Dr. P. K. SHAND (Lerwick, Shetland), Dr. D. A. R. HADDON, M.C. (Hawick, Roxburghshire), and Dr. R. L. HILL (Greenodd, Lancashire).

INDEX TO "THE LANCET," VOL. II., 1934

THE Index and Title-page to Vol. II., 1934, which was completed with the issue of Dec. 29th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.